



Mathematics Department

"Encourage each other and build each other up" (Thessalonians 5:11)

Year 7 Home Study Pack

- Lessons and activities are available on the Year 7 google classroom
 - Students should use Maths Whizz for at least 1 hour a week
- If students are stuck they should use the stream on the google classroom. This will be checked regularly between 9:00 am and 3:00 pm on school days during term time

The class code is: 35vm3d3

Pack 2 : Summer Term 1

Use this space for your
KEY SKILLS workings!



WEEK 3 SESSION 2 - Answer as many questions as you can in 5 mins

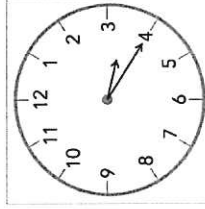
MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$20 + \square = 20$	
2	Double 53	
3	$51 + 10$	
4	$100 - 10$	
5	$8 = 4 + \square$	
6	$70 - 11 = 70 - 10 - \square$	
7	$7 + 7 + 7 + 7 = \square \times 7$	
8	What is the time on the clock?	pm
9	$1 + \square = 10$	
10	$66 + 34$	
Total out of 10		

Q	Question	Answer
1	$2 \times 3 = \square$	
2	$7 + 1 = \square$	
3	$8 \times \square = 80$	
4	$16 \div \square = 4$	
5	$9 \times 5 = \square$	
6	$35 \div 7 = \square$	
7	$\square \times 9 = 81$	
8	$\square + 10 = 2$	
9	$8 \times 2 = \square$	
10	$63 \div 9 = \square$	
Total out of 10		



Q	Question	Answer
1	$271 + 8501$	
2	$(8 - 2)^2 + 3 \times 4$	
3	Write 4335000 in words. (Use the opposite page for your answer)	
4	$0.8 \div 100$	
5	$(-1) \times (-9)$	
6	Round 61.9361 to 3 d.p.	
7	$(-7) + (-4)$	
8	Round 30% to 1 s.f.	
9	Letter at (-1, 1) A B C D E F G H I J K L M N P Q R S T U V W X Y Z	
10	$7/5 = 35/\square$	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS:

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



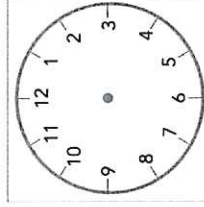
WEEK 3 SESSION 3 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$\square + 5 = 20$	
2	What is double 39?	
3	$65 + 10$	
4	$179 - 10$	
5	$6 = 2 + \square$	
6	$12 - 6 = 12 - 2 - \square$	
7	$86 = \square \times 86$	
8	Draw hands on the clock face showing 4:45 pm	
9	$\square + 8 = 10$	
10	$57 + 43$	
Total out of 10		



Q	Question	Answer
1	$2 \times 6 = \square$	
2	$24 \div 8 = \square$	
3	$9 \times \square = 81$	
4	$18 \div \square = 6$	
5	$4 \times 6 = \square$	
6	$6 + 1 = \square$	
7	$\square \times 4 = 28$	
8	$\square + 6 = 2$	
9	$8 \times 2 = \square$	
10	$5 + 1 = \square$	
Total out of 10		

Q	Question	Answer
1	$32 + 211$	
2	$3^2 + 2 \times 2$	
3	Write 6481504 in words. (Use the opposite page for your answer)	
4	$9.47 + 10$	
5	$(-8) \times (-8)$	
6	Round 48.2994 to 3 d.p.	
7	$(-6) + (-10)$	
8	Round 34 to 3 s.f.	
9	Letter at (-1, 1) y A B C D E F G H I J K L M N P Q R S T U V W X Y Z	
10	$4/2 = 8/\square$	
Total out of 10		

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MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

NINJA SCORE:

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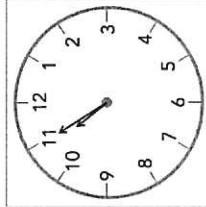
WEEK 3 SESSION 4 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

Q	Question	Answer
1	$13 + 7$	
2	Double 25	
3	$103 + 10$	
4	$165 - 80$	
5	$9 = 1 + \square$	
6	$44 - 8 = 44 - 4 - \square$	
7	$84 + 84 = 84 \times \square$	
8	What is the time on the clock?	pm
9	$2 + 8$	
10	$\square + 83 = 100$	
Total out of 10		

TIMESTABLES -
do these in your head

Q	Question	Answer
1	$2 \times 10 = \square$	
2	$4 \div 2 = \square$	
3	$10 \times \square = 50$	
4	$63 \div \square = 9$	
5	$5 \times 7 = \square$	
6	$6 + 3 = \square$	
7	$\square \times 1 = 8$	
8	$\square + 8 = 9$	
9	$7 \times 7 = \square$	
10	$80 \div 8 = \square$	
Total out of 10		



KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	$4677 + 507$	
2	$(102 - 2) \div 10$	
3	Write 963206 in words. (Use the opposite page for your answer)	
4	$0.27 \div 10$	
5	$2 \times (-2)$	
6	Round 96,2442 to 2 d.p.	
7	$10 + (-10)$	
8	Round 0.1535 to 1 s.f.	
9	Letter at (1, 1) $\begin{matrix} x & y \\ A & B & C & D & E \\ F & G & H & I & J \\ K & L & M & N & P & x \\ Q & R & S & T & U \\ V & W & X & Y & Z \end{matrix}$	
10	$10/10 = \square/40$	
Total out of 10		

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NINJA SCORE:

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WEEK 3 SESSION 5 - Answer as many questions as you can in 5 mins

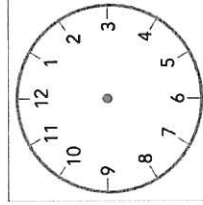
MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$3 + 17$	
2	What is double 55?	
3	$112 + 10$	
4	$29 - 10$	
5	$6 = 1 + \square$	
6	$58 - 11 = 58 - 8 - \square$	
7	$73 + 73 = \square \times 73$	
8	Draw hands on the clock face showing 10:10 am	
9	$7 + 3$	
10	$\square + 46 = 100$	
Total out of 10		

Q	Question	Answer
1	$6 \times 7 = \square$	
2	$24 + 4 = \square$	
3	$4 \times \square = 28$	
4	$24 + \square = 4$	
5	$7 \times 6 = \square$	
6	$18 + 6 = \square$	
7	$\square \times 4 = 4$	
8	$\square + 2 = 3$	
9	$5 \times 7 = \square$	
10	$54 + 6 = \square$	
Total out of 10		



Q	Question	Answer
1	$481 + 1429$	
2	$(9 - 5)^2 + 3 \times 4$	
3	Write One Thousand and Thirty Two in digits	
4	$0.35 + 100$	
5	$(-6) \times (-10)$	
6	Round 81.4358 to 2 d.p.	
7	$(-5) + (-5)$	
8	Round 21 to 2 s.f.	
9	Letter at (0, -1) y A B C D E F G H I J K L M N P x Q R S T U V W X Y Z	
10	$1/4 = 3/\square$	
Total out of 10		

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MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +



MY **NINJA** BELT:

NINJA SCORE:

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WEEK 4 SESSION 1 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES - do these in your head

TIMESTABLES - do these in your head

KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	$3 + 2$	
2	$\square + 25 = 100$	
3	What is half of 8?	
4	$150 - 10$	
5	$191 + \square = 210$	
6	$97 = 60 + \square$	
7	$135 - 132$	
8	$5 \times 8 = 40$, so $40 + 5 = \square$	
9	Write 20:11 in 12 hour clock format	
10	07:52 is how many minutes after 07:06?	
Total out of 10		

Q	Question	Answer
1	$2 \times 7 = \square$	
2	$6 \div 3 = \square$	
3	$3 \times \square = 21$	
4	$56 \div \square = 8$	
5	$10 \times 9 = \square$	
6	$30 + 10 = \square$	
7	$\square \times 4 = 16$	
8	$\square \div 9 = 6$	
9	$10 \times 8 = \square$	
10	$90 \div 10 = \square$	
Total out of 10		

Q	Question	Answer
1	What is $\frac{3}{9}$ of 54?	
2	964×9	
3	$1444 - 982$	
4	3.2×8.25	
5	$\frac{8}{10}$ as a decimal number	
6	$82.23 + 7.27$	
7	$36 + (-6)$	
8	If $a = 1$, $b = 3$ and $c = 4$, what is the value of $4b^3$?	
9	$10 - (-9)$	
10	Is 5 a factor of 21?	
Total out of 10		

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MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

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WEEK 4 SESSION 2 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$2 + \square = 5$	
2	$54 + 46$	
3	Halve 6	
4	$184 - 10$	
5	$91 + \square = 150$	
6	$83 = 60 + \square$	
7	$931 - 926$	
8	$9 \times 5 = 45$, so $45 \div 5 = \square$	
9	Write 8:13 am in 24 hour clock format	
10	From 2:46 am, how many minutes until 3:22 am?	
Total out of 10		

Q	Question	Answer
1	$10 \times 10 = \square$	
2	$8 + 8 = \square$	
3	$5 \times \square = 40$	
4	$20 \div \square = 5$	
5	$9 \times 8 = \square$	
6	$80 \div 8 = \square$	
7	$\square \times 6 = 18$	
8	$\square + 7 = 10$	
9	$2 \times 8 = \square$	
10	$12 \div 6 = \square$	
Total out of 10		

Q	Question	Answer
1	What is $\frac{1}{3}$ of 12?	
2	6×225	
3	$6543 - 5498$	
4	9.8×4.8	
5	100% as a decimal number	
6	$1.23 + 46.27$	
7	$(-24) \div (-3)$	
8	If $a = 7$, $b = 7$ and $c = 2$, what is the value of $ac / 2b$?	
9	$(-3) - (-7)$	
10	What is the highest common factor of 23 and 20?	
Total out of 10		

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WEEK 4 SESSION 3 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$2 + \square = 5$	
2	$4 + 96$	
3	What is half of 3?	
4	$80 - 10$	
5	$40 + \square = 130$	
6	$81 = 70 + \square$	
7	$722 - 719$	
8	$6 \times 2 = 12$, so $12 \div 6 = \square$	
9	Write 5:56 pm in 24 hour clock format	
10	From 8:13 am, how many minutes until 9:13 am?	
Total out of 10		

Q	Question	Answer
1	$5 \times 3 = \square$	
2	$49 \div 7 = \square$	
3	$8 \times \square = 64$	
4	$5 \div \square = 5$	
5	$10 \times 8 = \square$	
6	$12 \div 6 = \square$	
7	$\square \times 9 = 54$	
8	$\square \div 7 = 7$	
9	$7 \times 6 = \square$	
10	$7 \div 7 = \square$	
Total out of 10		

Q	Question	Answer
1	What is $5/7$ of 63?	
2	7×498	
3	$15939 - 9001$	
4	6.63×7	
5	89.9% as a decimal number	
6	$85.83 + 9.4$	
7	$(-30) \div (-10)$	
8	If $a = 8$, $b = 7$ and $c = 7$, what is the value of $\sqrt{a + bc}$?	
9	$(-10) - (-6)$	
10	What is the highest common factor of 8 and 2?	
Total out of 10		

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WEEK 4 SESSION 4 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$3 + 2$	
2	$\square + 80 = 100$	
3	What is half of 4?	
4	$84 - 10$	
5	$122 + \square = 200$	
6	$82 = 12 + \square$	
7	$588 - 585$	
8	$8 \times 9 = 72$, so $72 \div 8 = \square$	
9	Write 05:53 in 12 hour clock format.	
10	1:46 pm is how many minutes after 1:30 pm?	
Total out of 10		

Q	Question	Answer
1	$5 \times 10 = \square$	
2	$42 \div 6 = \square$	
3	$8 \times \square = 24$	
4	$10 \div \square = 1$	
5	$8 \times 9 = \square$	
6	$8 \div 8 = \square$	
7	$\square \times 4 = 16$	
8	$\square \div 7 = 7$	
9	$1 \times 9 = \square$	
10	$70 \div 10 = \square$	
Total out of 10		

Q	Question	Answer
1	What is $\frac{4}{10}$ of 20?	
2	489×5	
3	$14704 - 8633$	
4	6.1×80.09	
5	70% as a fraction	
6	$0.41 + 61.21$	
7	$(-40) \div (-5)$	
8	If $a = 6$, $b = 6$ and $c = 10$, what is the value of $2abc - c^2$?	
9	$(-6) - (-6)$	
10	Is 7 a factor of 24?	
Total out of 10		

What's your **NINJA** Score?
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MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

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WEEK 4 SESSION 5 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$\square + 3 = 5$	
2	$68 + \square = 100$	
3	What is half of 4?	
4	$189 - 10$	
5	$161 + \square = 240$	
6	$74 = 24 + \square$	
7	$629 - 627$	
8	$9 \times 5 = 45$, so $45 + 9 = \square$	
9	Write 8:23 am in 24 hour clock format	
10	2:15 pm is how many minutes after 2:05 pm?	
Total out of 10		

Q	Question	Answer
1	$5 \times 1 = \square$	
2	$24 + 8 = \square$	
3	$5 \times \square = 30$	
4	$45 + \square = 9$	
5	$6 \times 1 = \square$	
6	$40 + 4 = \square$	
7	$\square \times 1 = 10$	
8	$\square + 3 = 9$	
9	$6 \times 4 = \square$	
10	$2 + 2 = \square$	
Total out of 10		

Q	Question	Answer
1	What is $\frac{4}{6}$ of 30?	
2	3×911	
3	$16071 - 8966$	
4	6.9×5.85	
5	$\frac{8}{10}$ as a decimal number	
6	$23.8 + 0.55$	
7	$(-18) \div 9$	
8	If $a = 6$, $b = 8$ and $c = 4$, what is the value of $(2b/c)^2$	
9	$(-1) - (-3)$	
10	Is 1 a factor of 3?	
Total out of 10		

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MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS:

MY NINJA BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 5 SESSION 1 - Answer as many questions as you can in 5 mins


MENTAL STRATEGIES -
do these in your head

Q	Question	Answer
1	$\square + 9 = 10$	
2	What is double 6?	
3	Halve 24	
4	$143 + 60$	
5	$94 + 97$	
6	$41 + 10 = 41 + \square$	
7	$1 + 700$	
8	$31 + 47 = 30 + 40 + \square$	
9	What is double 56?	
10	What is half of 4?	
Total out of 10		

TIMESTABLES -
do these in your head

Q	Question	Answer
1	$7 \times 10 = \square$	
2	$21 \div 3 = \square$	
3	$3 \times \square = 18$	
4	$5 \div \square = 1$	
5	$1 \times 2 = \square$	
6	$30 \div 3 = \square$	
7	$\square \times 2 = 8$	
8	$\square + 3 = 6$	
9	$3 \times 6 = \square$	
10	$63 \div 7 = \square$	
Total out of 10		

KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	What is 25% of £190?	
2	$6146 \div 7$	
3	$4 + 5 \times 1$	
4	$462.2 \div 5$	
5	1000×0.64	
6	$69.12 - 9.2$	
7	Write 35/49 in its simplest form	
8	$10 - 10$	
9	Value of the dot? 	
10	What is the lowest common multiple of 6 and 8?	
Total out of 10		

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MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS:

+

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WEEK 5 SESSION 2 - Answer as many questions as you can in 5 mins


MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$\square + 5 = 10$	
2	What is double 7?	
3	Halve 57	
4	$93 + 30$	
5	$82 + 84$	
6	$87 + 11 = 87 + \square$	
7	$1 + 487$	
8	$14 + 40 = 14 + 40 + \square$	
9	What is double 79?	
10	What is half of 7?	
Total out of 10		

Q	Question	Answer
1	$2 \times 2 = \square$	
2	$9 + 3 = \square$	
3	$8 \times \square = 16$	
4	$35 + \square = 5$	
5	$2 \times 1 = \square$	
6	$10 + 2 = \square$	
7	$\square \times 6 = 48$	
8	$\square + 8 = 6$	
9	$9 \times 3 = \square$	
10	$70 \div 7 = \square$	
Total out of 10		

Q	Question	Answer
1	What is 45% of £140?	
2	$3996 \div 4$	
3	$5 + 10 \times 3$	
4	$7.474 + 0.2$	
5	0.939×1000	
6	$96.54 - 8.01$	
7	Simplify $2/18$	
8	Difference between -10 and 9	
9	Value of the dot? 	
10	What is the lowest common multiple of 7 and 8?	
Total out of 10		

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MENTAL STRATEGIES:

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WEEK 5 SESSION 3 - Answer as many questions as you can in 5 mins

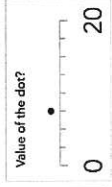
MENTAL STRATEGIES -
do these in your head

Q	Question	Answer
1	$9 + 1$	
2	What is double 3?	
3	Halve 94	
4	$44 + 40$	
5	$20 + 23$	
6	$83 + 10 = 83 + 7 + \square$	
7	$5 + 695$	
8	$46 + 56 = 40 + 50 + \square$	
9	Double 25	
10	What is half of 5?	
Total out of 10		

TIMESTABLES -
do these in your head

Q	Question	Answer
1	$10 \times 10 = \square$	
2	$28 + 7 = \square$	
3	$8 \times \square = 16$	
4	$40 \div \square = 4$	
5	$7 \times 1 = \square$	
6	$56 \div 8 = \square$	
7	$\square \times 8 = 32$	
8	$\square + 4 = 9$	
9	$9 \times 2 = \square$	
10	$6 + 1 = \square$	
Total out of 10		

KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	What is 10% of £200?	
2	$1386 \div 3$	
3	$8 + 2 + 1$	
4	$47.915 \div 0.5$	
5	100×88.255	
6	$51 - 1.02$	
7	Write $9/18$ in its simplest form	
8	Which is the lowest number, -7 or -4?	
9	Value of the dot? 	
10	What is the lowest common multiple of 5 and 6?	
Total out of 10		



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TIMESTABLES:

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MY **NINJA** BELT:

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WEEK 5 SESSION 4 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

Q	Question	Answer
1	$\square + 5 = 10$	
2	Double 9	
3	What is half of 59?	
4	$71 + 60$	
5	$98 + 99$	
6	$73 + 8 = 73 + 7 + \square$	
7	$5 + 712$	
8	$25 + 60 = 20 + 60 + \square$	
9	What is double 40?	
10	Halve 3	
Total out of 10		

TIMESTABLES -
do these in your head

Q	Question	Answer
1	$3 \times 7 = \square$	
2	$80 + 10 = \square$	
3	$3 \times \square = 15$	
4	$4 \div \square = 1$	
5	$8 \times 6 = \square$	
6	$40 \div 4 = \square$	
7	$\square \times 8 = 8$	
8	$\square + 10 = 9$	
9	$2 \times 2 = \square$	
10	$2 \div 2 = \square$	
Total out of 10		

KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	What is 5% of £100?	
2	$5292 \div 7$	
3	$90 - 4 + 4$	
4	$15.22 \div 0.2$	
5	6.16×100	
6	$32.68 - 3.54$	
7	Write $24/80$ in its simplest form	
8	Difference between 6 and -3	
9		
10	List the first 4 multiples of 12	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS:

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 5 SESSION 5 - Answer as many questions as you can in 5 mins

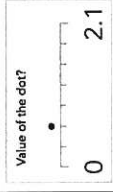
MENTAL STRATEGIES -
do these in your head

Q	Question	Answer
1	$\square + 7 = 10$	
2	What is double 9?	
3	Halve 40	
4	$111 + 30$	
5	$66 + 63$	
6	$17 + 9 = 17 + 3 + \square$	
7	$3 + 468$	
8	$33 + 70 = 30 + 70 + \square$	
9	Double 58	
10	What is half of 7?	
Total out of 10		

TIMESTABLES -
do these in your head

Q	Question	Answer
1	$6 \times 2 = \square$	
2	$36 \div 6 = \square$	
3	$5 \times \square = 15$	
4	$56 \div \square = 7$	
5	$3 \times 9 = \square$	
6	$5 \div 5 = \square$	
7	$\square \times 9 = 9$	
8	$\square \div 6 = 3$	
9	$8 \times 3 = \square$	
10	$18 \div 3 = \square$	
Total out of 10		

KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	What is 125% of £150?	
2	$1710 \div 5$	
3	$85 - 15 \div 5$	
4	$28.82 + 0.5$	
5	71.204×100	
6	$25 - 1.33$	
7	Simplify $6/60$	
8	Which is the lowest number, -4 or -3?	
9	Value of the dot? 	
10	List the first 4 multiples of 11	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 6 SESSION 1 - Answer as many questions as you can in 5 mins

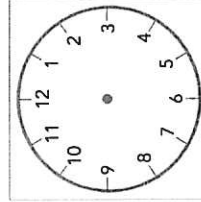
MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$17 + \square = 20$	
2	What is double 36?	
3	$89 + 10$	
4	$143 - 20$	
5	$5 = 4 + \square$	
6	$14 - 7 = 14 - 4 - \square$	
7	$56 + 56 = \square \times 56$	
8	Draw hands on the clock face showing 7:05 pm	
9	What is double 9?	
10	Halve 48	
Total out of 10		

Q	Question	Answer
1	$5 \times 10 = \square$	
2	$18 + 6 = \square$	
3	$9 \times \square = 63$	
4	$32 + \square = 4$	
5	$5 \times 9 = \square$	
6	$3 + 3 = \square$	
7	$\square \times 3 = 24$	
8	$\square + 3 = 10$	
9	$1 \times 3 = \square$	
10	$10 \div 5 = \square$	
Total out of 10		



Q	Question	Answer
1	What is the value of (-15) squared?	
2	$986 + 3175$	
3	$\sqrt{64} + 8 + 8$	
4	Write 780026 in words. (Use the opposite page for your answer)	
5	$13.089 \div 1000$	
6	$(-1) \times (-6)$	
7	Round 6.5254 to 2 d.p.	
8	$10 + (-5)$	
9	Round 0.006435 to 1 s.f.	
10	Letter at $(-2, -2)$ A B C D E F G H I J K L M N P Q R S T U V W X Y Z	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 6 SESSION 2 - Answer as many questions as you can in 5 mins

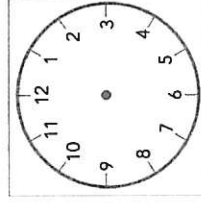
MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$8 + \square = 20$	
2	Double 49	
3	$69 + 10$	
4	$196 - 80$	
5	$6 = 3 + \square$	
6	$53 - 8 = 53 - 3 - \square$	
7	$9 = 9 \times \square$	
8	Draw hands on the clock face showing quarter to nine	
9	What is double 8?	
10	Halve 14	
Total out of 10		

Q	Question	Answer
1	$8 \times 1 = \square$	
2	$28 + 4 = \square$	
3	$2 \times \square = 6$	
4	$28 + \square = 4$	
5	$4 \times 6 = \square$	
6	$6 + 3 = \square$	
7	$\square \times 2 = 8$	
8	$\square + 7 = 8$	
9	$8 \times 8 = \square$	
10	$80 + 10 = \square$	
Total out of 10		



Q	Question	Answer																									
1	What is the value of 15 squared?																										
2	$3530 + 6819$																										
3	$(8 - 2) \times 2$																										
4	Write Twenty Four Thousand, Three Hundred in digits																										
5	$43.537 \div 100$																										
6	$(-8) \times 1$																										
7	Round 22.7383 to 1 d.p.																										
8	$2 + (-7)$																										
9	Round 275 to 1 s.f.																										
10	Letter at (2, 1) <table border="0" style="font-family: monospace; font-size: small;"> <tr><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr> <tr><td>F</td><td>G</td><td>H</td><td>I</td><td>J</td></tr> <tr><td>K</td><td>L</td><td>M</td><td>N</td><td>P</td></tr> <tr><td>Q</td><td>R</td><td>S</td><td>T</td><td>U</td></tr> <tr><td>V</td><td>W</td><td>X</td><td>Y</td><td>Z</td></tr> </table>	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	
A	B	C	D	E																							
F	G	H	I	J																							
K	L	M	N	P																							
Q	R	S	T	U																							
V	W	X	Y	Z																							
Total out of 10																											

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY NINJA BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



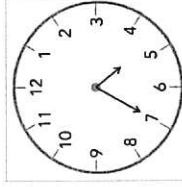
WEEK 6 SESSION 3 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$11 + \square = 20$	
2	What is double 34?	
3	$193 + 10$	
4	$140 - 50$	
5	$4 = 1 + \square$	
6	$19 - 11 = 19 - \square$	
7	$14 + 14 + 14 = \square \times 14$	
8	What is the time on the clock? am	
9	What is double 8?	
10	What is half of 72?	
Total out of 10		



Q	Question	Answer
1	$7 \times 4 = \square$	
2	$1 \div 1 = \square$	
3	$10 \times \square = 100$	
4	$90 \div \square = 10$	
5	$8 \times 8 = \square$	
6	$30 \div 5 = \square$	
7	$\square \times 10 = 10$	
8	$\square \div 8 = 7$	
9	$4 \times 9 = \square$	
10	$4 \div 4 = \square$	
Total out of 10		

Q	Question	Answer
1	What is the positive value of $\sqrt{16}$?	
2	$224 + 9070$	
3	$(7 + 1) \times 3$	
4	Write Four Hundred and Sixty Two in digits	
5	$59,742 + 10$	
6	$(-7) \times (-4)$	
7	Round 0.9451 to 2 d.p.	
8	$2 + (-2)$	
9	Round 0.8243 to 3 s.f.	
10	Letter at (-1, 1) x y A B C D E F G H I J K L M N P x Q R S T U V W X Y Z	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



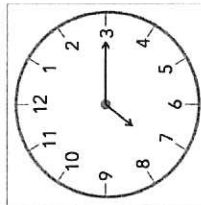
WEEK 6 SESSION 4 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

Q	Question	Answer
1	$\square + 17 = 20$	
2	Double 66	
3	$95 + 10$	
4	$25 - 20$	
5	$6 = 4 + \square$	
6	$66 - 10 = 66 - \square$	
7	$9 = 9 \times \square$	
8	What is the time on the clock? pm	
9	Double 5	
10	What is half of 59?	
Total out of 10		

TIMESTABLES -
do these in your head

Q	Question	Answer
1	$4 \times 3 = \square$	
2	$12 \div 4 = \square$	
3	$5 \times \square = 25$	
4	$10 \div \square = 2$	
5	$4 \times 7 = \square$	
6	$14 \div 2 = \square$	
7	$\square \times 8 = 80$	
8	$\square + 1 = 3$	
9	$5 \times 6 = \square$	
10	$18 \div 2 = \square$	
Total out of 10		



KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	What is the positive value of $\sqrt{25}$?	
2	$1668 + 2809$	
3	$(10 - 10)^2 + 3 \times 2$	
4	Write Ten Thousand, Nine Hundred in digits	
5	$62.487 + 1000$	
6	$2 \times (-7)$	
7	Round 45.4952 to 3 d.p.	
8	$(-4) + (-3)$	
9	Round 0.002734 to 3 s.f.	
10	Letter at (2, -2) y A B C D E F G H I J K L M N P Q R S T U V W X Y Z	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 6 SESSION 5 - Answer as many questions as you can in 5 mins

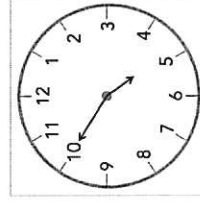
MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$1 + \square = 20$	
2	Double 54	
3	$22 + 10$	
4	$44 - 40$	
5	$7 = 2 + \square$	
6	$75 - 11 = 75 - 5 - \square$	
7	$6 + 6 + 6 + 6 + 6 = 6 \times \square$	
8	What is the time on the clock?	pm
9	Double 7	
10	What is half of 44?	
Total out of 10		

Q	Question	Answer
1	$6 \times 6 = \square$	
2	$2 \div 2 = \square$	
3	$6 \times \square = 12$	
4	$40 \div \square = 5$	
5	$1 \times 9 = \square$	
6	$40 \div 8 = \square$	
7	$\square \times 7 = 49$	
8	$\square \div 3 = 1$	
9	$2 \times 2 = \square$	
10	$48 \div 6 = \square$	
Total out of 10		



Q	Question	Answer
1	What is the value of 11?	
2	$7905 + 626$	
3	$(10 - 9) \times 1$	
4	Write 744620 in words. (Use the opposite page for your answer)	
5	$0.67 \div 100$	
6	$3 \times (-1)$	
7	Round 1.982 to 2 d.p.	
8	$(-3) + (-6)$	
9	Round 0.2352 to 3 s.f.	
10	Letter at (0, 1)	
Total out of 10		

A	B	C	D	E
F	G	H	I	J
K	L	M	N	P
Q	R	S	T	U
V	W	X	Y	Z

What's your NINJA Score?
Fill in your scores in the boxes
and calculate it now!

MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS:



MY NINJA BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 7 SESSION 1 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

Q	Question	Answer
1	$4 + 1$	
2	$66 + \square = 100$	
3	What is half of 6?	
4	$122 - 10$	
5	$56 + \square = 90$	
6	$56 = 26 + \square$	
7	$199 - 194$	
8	$10 \times 5 = 50$, so $50 \div 10 = \square$	
9	Write 2:15 pm in 24 hour clock format	
10	From 15:09, how many minutes until 15:30?	
Total out of 10		

TIMESTABLES -
do these in your head

Q	Question	Answer
1	$9 \times 5 = \square$	
2	$60 \div 6 = \square$	
3	$2 \times \square = 16$	
4	$10 \div \square = 1$	
5	$9 \times 10 = \square$	
6	$12 + 2 = \square$	
7	$\square \times 5 = 20$	
8	$\square + 4 = 6$	
9	$8 \times 3 = \square$	
10	$18 \div 6 = \square$	
Total out of 10		

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	List all the factors of 2	
2	What is $1/2$ of 8?	
3	65×38	
4	$11661 - 7509$	
5	8.2×3.5	
6	173.2% as a decimal number	
7	$13 + 4.5$	
8	$40 \div (-10)$	
9	If $a = 4$, $b = 5$ and $c = 7$, what is the value of $3b - 2a$?	
10	$7 - (-5)$	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 7 SESSION 2 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$3 + 2$	
2	$75 + \square = 100$	
3	Halve 2	
4	$159 - 10$	
5	$61 + \square = 130$	
6	$96 = 60 + \square$	
7	$712 - 711$	
8	$1 \times 9 = 9$, so $9 + 1 = \square$	
9	Write 17:39 in 12 hour clock format	
10	From 01:49, how many minutes until 02:29?	
Total out of 10		

Q	Question	Answer
1	$2 \times 6 = \square$	
2	$28 + 7 = \square$	
3	$4 \times \square = 36$	
4	$24 + \square = 4$	
5	$6 \times 7 = \square$	
6	$8 + 8 = \square$	
7	$\square \times 8 = 40$	
8	$\square + 2 = 7$	
9	$3 \times 8 = \square$	
10	$8 + 8 = \square$	
Total out of 10		

Q	Question	Answer
1	What is the highest common factor of 11 and 3?	
2	What is 4/5 of 5?	
3	5×666	
4	$18897 - 9897$	
5	4.61×5	
6	17% as a decimal number	
7	$11 + 8.69$	
8	$(-8) + 2$	
9	If $a = 2$, $b = 2$ and $c = 8$, what is the value of $ac^2 + 2$?	
10	$6 - (-8)$	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 7 SESSION 3 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$1 + \square = 5$	
2	$\square + 58 = 100$	
3	Halve 7	
4	$158 - 10$	
5	$91 + \square = 180$	
6	$114 = 24 + \square$	
7	$104 - 100$	
8	$2 \times 8 = 16$, so $16 \div 8 = \square$	
9	Write 02:29 in 12 hour clock format.	
10	4:14 pm is how many minutes after 3:56 pm?	
Total out of 10		

Q	Question	Answer
1	$2 \times 3 = \square$	
2	$18 \div 2 = \square$	
3	$3 \times \square = 15$	
4	$20 \div \square = 5$	
5	$2 \times 3 = \square$	
6	$70 \div 7 = \square$	
7	$\square \times 2 = 2$	
8	$\square \div 3 = 5$	
9	$6 \times 9 = \square$	
10	$6 \div 3 = \square$	
Total out of 10		

Q	Question	Answer
1	What is the highest common factor of 24 and 4?	
2	What is $\frac{4}{6}$ of 6?	
3	549×4	
4	$6062 - 3640$	
5	8.7×85.92	
6	$0.83 = \square\%$	
7	$11 + 1.14$	
8	$(-30) + (-5)$	
9	If $a = 10$, $b = 6$ and $c = 4$, what is the value of $3b - (a + c)$?	
10	$4 - (-2)$	
Total out of 10		

What's your **NINJA** Score?

Fill in your scores in the boxes
and calculate it now!



MENTAL
STRATEGIES:


TIMESTABLES:

KEY SKILLS:

+

MY **NINJA** BELT:

NINJA SCORE:



Use this space for your **KEY SKILLS** workings!

WEEK 7 SESSION 4 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES - do these in your head

TIMESTABLES - do these in your head

KEY SKILLS - you may use written calculations for these questions

Q	Question	Answer
1	4 + 1	
2	$\square + 78 = 100$	
3	Halve 6	
4	165 - 10	
5	116 + $\square = 130$	
6	66 = 20 + \square	
7	186 - 182	
8	7 x 5 = 35, so 35 + 5 = \square	
9	Write 12:10 pm in 24 hour clock format	
10	1:57 am is how many minutes after 1:13 am?	
Total out of 10		

Q	Question	Answer
1	3 x 4 = \square	
2	36 ÷ 9 = \square	
3	8 x $\square = 80$	
4	15 ÷ $\square = 5$	
5	6 x 1 = \square	
6	16 + 8 = \square	
7	$\square \times 10 = 60$	
8	$\square + 10 = 3$	
9	3 x 3 = \square	
10	24 ÷ 4 = \square	
Total out of 10		

Q	Question	Answer
1	Is 10 a factor of 36?	
2	What is 2/4 of 4?	
3	2 x 344	
4	18797 - 9492	
5	5 x 1.6	
6	0.56 = $\square\%$	
7	15 + 0.47	
8	12 + (-4)	
9	If a = 1 b = 4 and c = 9, what is the value of $c^2 - b^3$	
10	(-10) - (-9)	
Total out of 10		



What's your **NINJA** Score?
Fill in your scores in the boxes and calculate it now!

MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS:

MY **NINJA** BELT:

NINJA SCORE:

Use this space for your
KEY SKILLS workings!



WEEK 7 SESSION 5 - Answer as many questions as you can in 5 mins

MENTAL STRATEGIES -
do these in your head

TIMESTABLES -
do these in your head

KEY SKILLS - you may use written calculations
for these questions

Q	Question	Answer
1	$\square + 3 = 5$	
2	$15 + 85$	
3	Halve 2	
4	$196 - 10$	
5	$188 + \square = 260$	
6	$62 = 32 + \square$	
7	$604 - 601$	
8	$8 \times 4 = 32$, so $32 + 4 = \square$	
9	Write 05:48 in 12 hour clock format	
10	From 22:06, how many minutes until 22:28?	
Total out of 10		

Q	Question	Answer
1	$4 \times 4 = \square$	
2	$8 + 4 = \square$	
3	$8 \times \square = 16$	
4	$5 \div \square = 1$	
5	$6 \times 8 = \square$	
6	$9 \div 3 = \square$	
7	$\square \times 6 = 24$	
8	$\square \div 2 = 10$	
9	$7 \times 6 = \square$	
10	$70 \div 10 = \square$	
Total out of 10		

Q	Question	Answer
1	What is the highest common factor of 29 and 22?	
2	What is $3/4$ of 40?	
3	6×564	
4	$14786 - 8106$	
5	9.4×7.4	
6	$2/10$ as a decimal number	
7	$34.53 + 6.2$	
8	$(-1) \div 1$	
9	If $a = 4$, $b = 1$ and $c = 2$, what is the value of $3a / 2$?	
10	$1 - (-2)$	
Total out of 10		

What's your **NINJA** Score?
Fill in your scores in the boxes
and calculate it now!



MENTAL STRATEGIES:

TIMESTABLES:

KEY SKILLS: +

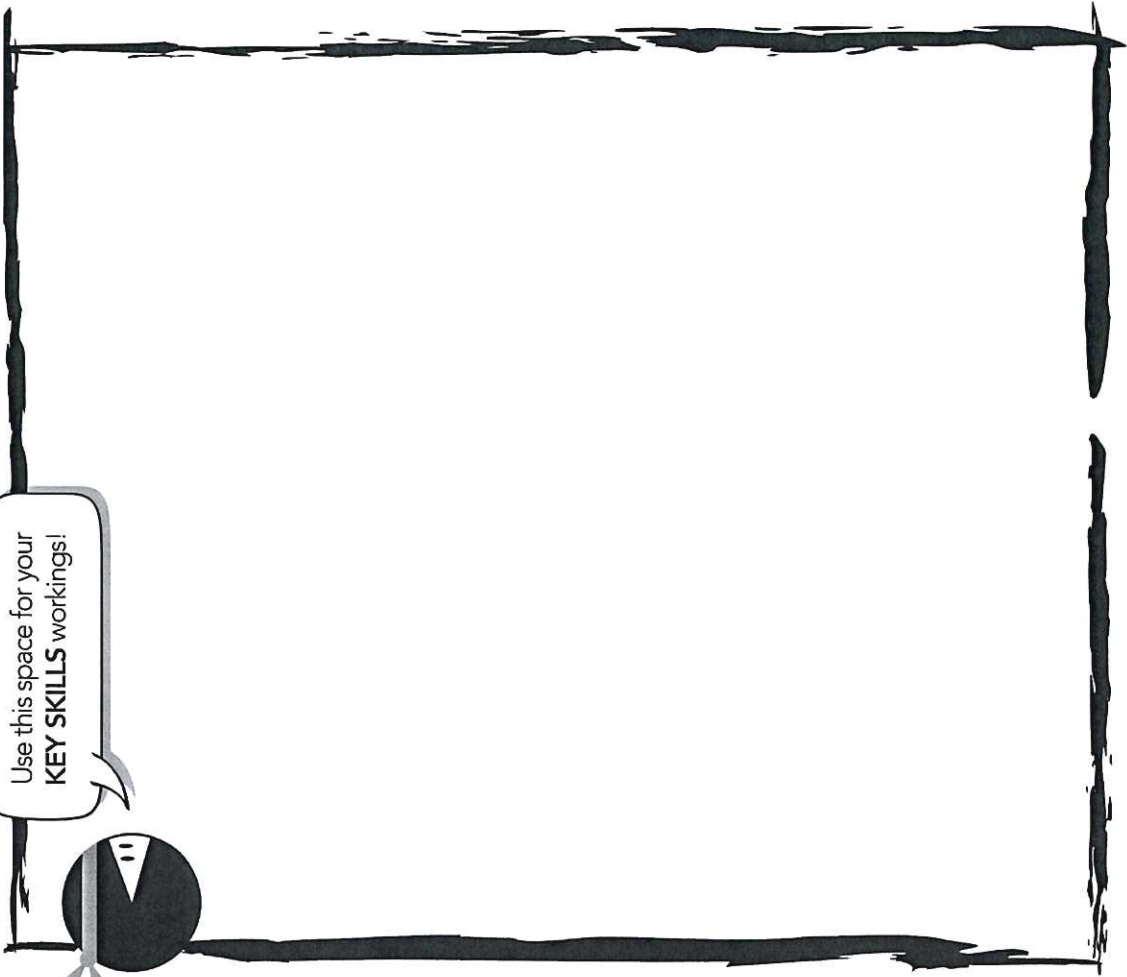
MY **NINJA** BELT:

NINJA SCORE:



5 MINUTE SKILL CHECK

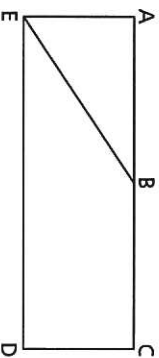
Use this space for your
KEY SKILLS workings!



Understand and use letter and labelling conventions including those for geometric figures

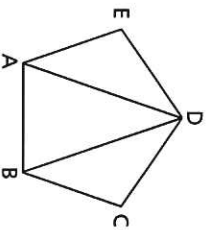


- 1 Here is a shape with five points marked.



Shade the quadrilateral BCDE.

- 2 ABCDE is a pentagon.

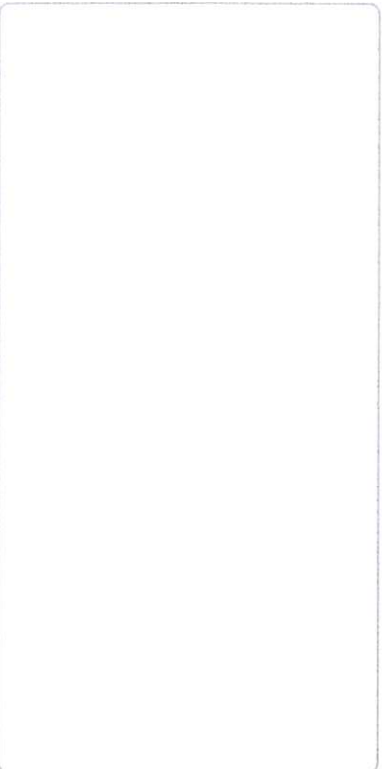


a) Shade triangle BCD blue.

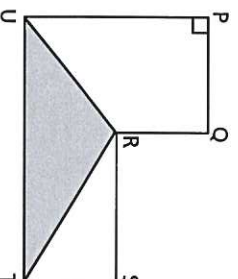
b) Shade one of the other triangles a different colour.

What is this triangle called? _____

- 3 EFGH is a kite. Draw shape EFGH.



- 4 Here is a shape.



- a) Complete the sentences.

Shape RST is a _____

PU is a _____

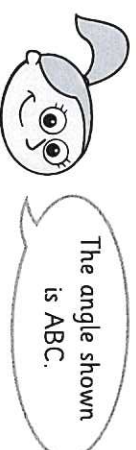
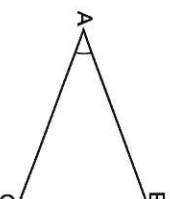
Angle _____ is a right angle.

The shaded triangle is called triangle _____

- b) The shape contains two trapeziums.

Describe the two trapeziums using letters.

- 5 Here is an angle.



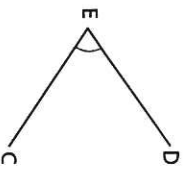
Do you agree with Eva? _____

Explain your answer.

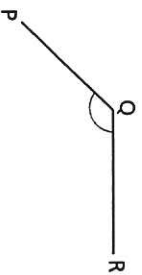
6

Use three-letter angle notation to describe the angles.

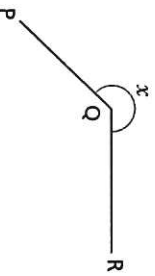
a)



b)



c) How would you describe the angle marked x ?



7

Draw the given angles on the grids.

a) Draw angle CLN.

A°

B°

C°

D°

E°

F°

G°

H°

I°

J°

K°

L°

M°

N°

O°

b) Draw angle NLC.

A°

B°

C°

D°

E°

F°

G°

H°

I°

J°

K°

L°

M°

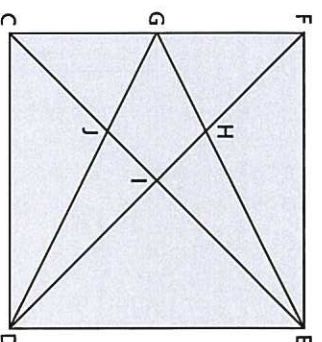
N°

O°

What do you notice?

8

Some lines, angles and shapes have been drawn.



a) Label each angle with the letter shown.

angle x = angle EDI angle y = angle GHD

b) Using letter notation, write the names of:

- two different triangles _____
- a kite _____
- an arrowhead _____
- a vertical line segment _____
- a horizontal line segment _____

c)



Four letters will always make a quadrilateral.

Prove that Ron is incorrect.

Draw and measure line segments including geometric figures

1 Draw and label the line segments.

a) $AB = 5$ cm

b) $XY = 7$ cm

c) $MN = 4,5$ cm

2 Measure the line segments.

a) 

$BC =$ cm

b) 

$ST =$ cm

c) 

$PQ =$ cm

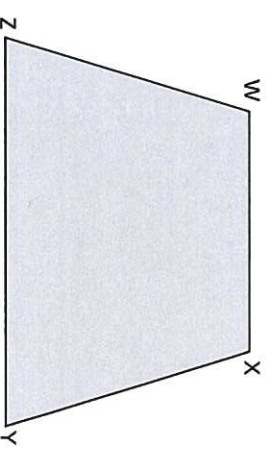
3 Line segments DE and FG are perpendicular.

DE measures 5 cm.

FG measures 4,3 cm.

Draw a diagram to represent this information.

4 Here is trapezium WXYZ.



Prove, through measuring, that trapezium WXYZ is isosceles. Talk about your findings with a partner.

5

ABCD is a rectangle.

Side AB measures 3 cm.

Side BC measures 5 cm.

a) Draw and label the rectangle.

b) Measure the length of the diagonal BD.

BD = cm

c) What is the length of the diagonal AC?

AC = cm

Did you need to measure AC?



6

Draw and label the following line segments.

a) $LM = 4\frac{1}{2}$ cm

b) $EF = 5\frac{1}{5}$ cm

c) $JK = 6\frac{3}{5}$ cm

7

Points A, B, C and D lie on a straight line.

AB is half the length of BC.

The length of CD is equal to the length of AC.

AD is 9 cm in length.

Draw an accurate drawing of line segment ABCD.



8

Dani thinks line segment AEI will be longer than line segment ABC.

Huan thinks line segment AEI will be the same length as line segment ABC.

A• B• C•

D• E• F•

G• H• I•

a) Who do you agree with? _____

Measure each line segment to check.

b) Complete the sentences.

DE is equal to _____

GE is half the length of _____

ADG is shorter than _____

Understand angles as a measure of turn



- 1 Whitney is facing in the direction of the arrow.
She turns through half a turn.



Show the direction that Whitney is now facing.



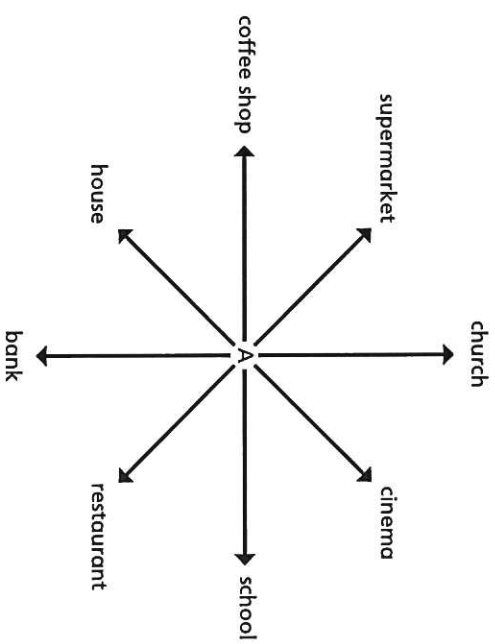
- 2 Teddy is facing in the direction of the arrow.
He turns through half a turn.



- a) Show the direction that Teddy is now facing.
b) Mark the angle that Teddy has turned through.
c) What angle has Teddy turned through?



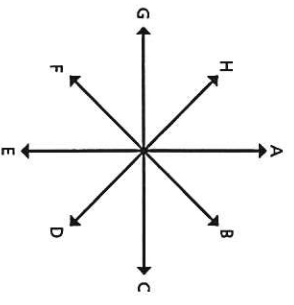
- 3 The diagram shows a compass and the direction of some places.
Kim, Jack, Annie and Mo are all standing at point A.



- a) Kim is facing the church.
She turns through a quarter of a turn clockwise.
Which place is she now facing? _____
- b) Jack is facing the cinema.
He turns through a quarter of a turn.
Which two places could he be facing?
_____ or _____
- c) Annie is facing the restaurant.
Complete the sentence.
She makes a _____ and she is facing the supermarket.
- d) Mo is facing the coffee shop.
He makes a three-quarter turn clockwise.
Where is he now facing? _____

4

Amir is facing C.
He turns to face E.



What two possible turns could Amir have made?
Describe each turn.

5

a) Complete the sentences.

1 full turn is equal to °.

2 full turns are equal to °.

3 full turns are equal to °.

$\frac{1}{2}$ of a full turn is equal to °.

$\frac{1}{4}$ of a full turn is equal to °.

$\frac{3}{4}$ of a full turn is equal to °.

b) How many degrees are equal to $2\frac{3}{4}$ full turns?

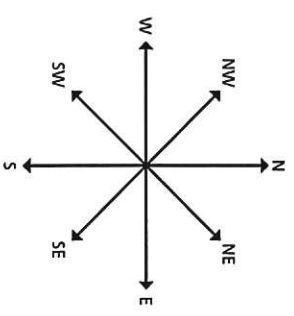
°

c) How many degrees are equal to $1\frac{1}{3}$ full turns?

°

6

The diagram shows compass points.



a) A ship is heading north.
It turns through 90° clockwise.
Which direction is the ship now facing?

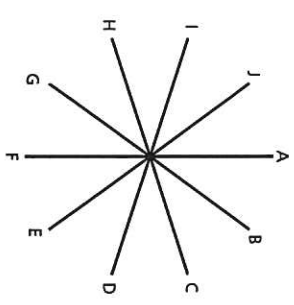
b) Another ship is heading SE.
It turns through 90° clockwise.
Which direction is this ship now facing?

c) A final ship is heading NW.
The ship turns anticlockwise to face NE.
How many degrees has the ship turned through?

°

7

Filip is facing A.
He makes ten equal-sized turns.

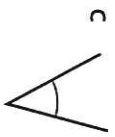
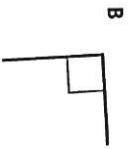
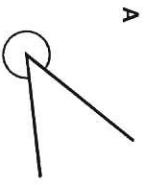


He finishes facing A.
How many degrees did he turn through to face G?

°

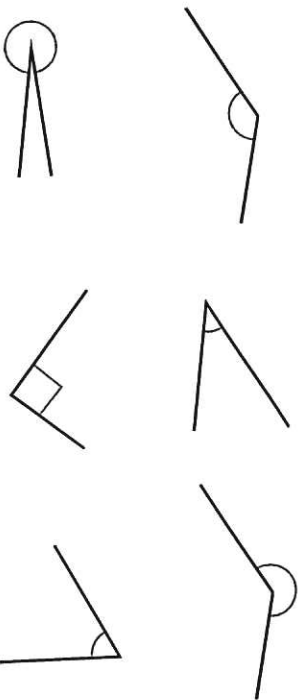
Classify angles

1 Sort the angles into the table.

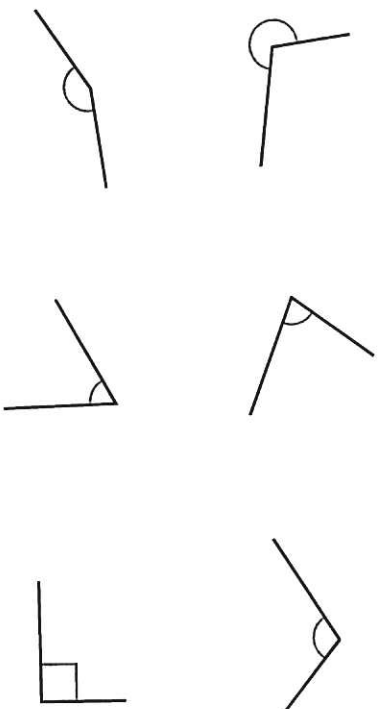


Acute angle	Obtuse angle	Right angle	Reflex angle

2 Circle all the acute angles.



3 Circle all the obtuse angles.



4 Write acute, obtuse or reflex to label each angle.

a) _____

b) _____

c) _____

d) _____

e) _____

f) _____

g) _____

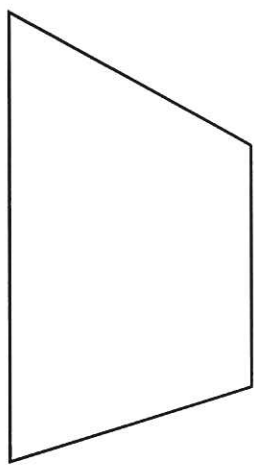
h) _____

i) _____

j) _____

5

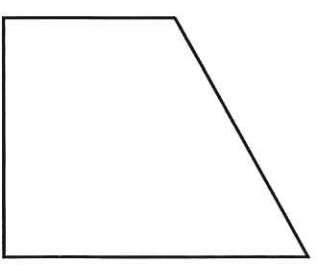
Here is a trapezium.



- a) Label the acute angles 'A'.
- b) Label the obtuse angles 'O'.
- c) Draw an arc to show a reflex angle.

6

This is a right trapezium.



Label the right angles.



7

Complete the table for the interior angles of each shape.



Shape	Name	Number of acute angles	Number of obtuse angles	Number of right angles	Number of reflex angles
A					
B					
C					
D					
E					
F					

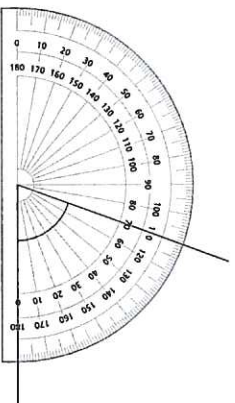
How would your answers change for the exterior angles of the shapes?
Talk about it with a partner.



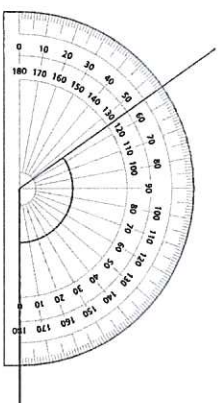
Measure angles up to 180°

1 What is the size of the angle marked in each diagram?

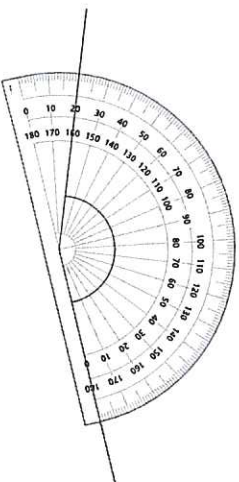
a)



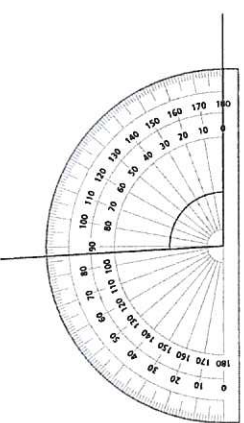
b)



c)



d)



2 Nijah measures this angle.

She says the angle marked is 30°.



a) How do you know, just by looking at the angle, that it is not 30°?

b) What mistake do you think Nijah has made?

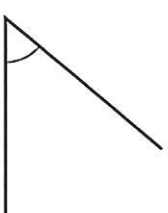
c) What is the size of the angle?

3 Amir and Rosie each draw an angle.



My angle is greater than yours.

Amir



That's not correct. Our angles are the same.

Rosie

a) Measure to show that Rosie is correct.

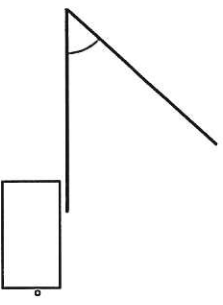
What is the size of both angles?

b) Why do you think Amir thought his angle was greater than Rosie's?

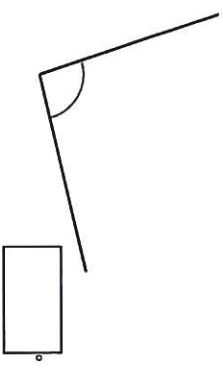
4

Use a protractor to measure the angles.

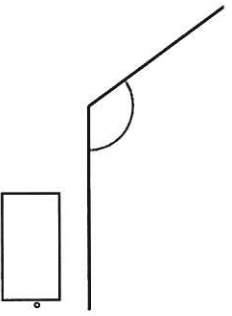
a)



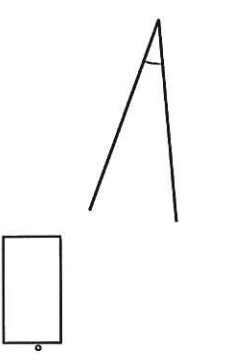
d)



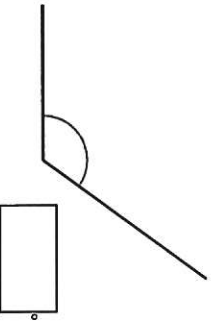
b)



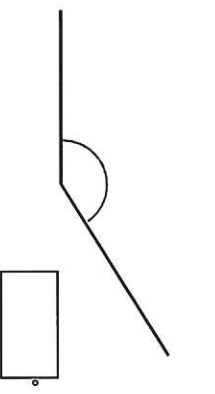
e)



c)

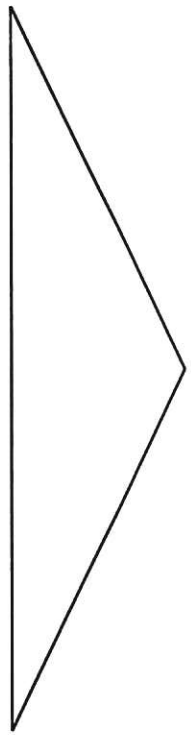


f)



5

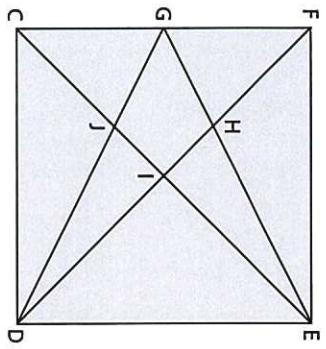
Measure each of the angles in this triangle and label them on the diagram.



What check could you do to see if you are correct?

6

Measure the angles in the diagram.



a) $\angle CDJ$

d) $\angle FCJ$

e) $\angle GEI$

b) $\angle FCE$

d) $\angle HIJ$

f) $\angle FHJ$

7

Captain Jones is facing the tree.



X Captain Jones



a) He turns clockwise to face the pirate ship.

What angle does he turn through?

b) Captain Jones then turns clockwise to face the treasure chest.

What angle has he turned through now?

Draw angles up to 180°



1

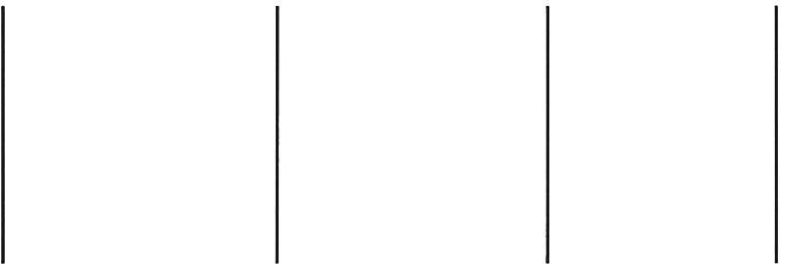
Draw the angles. Use the given line as part of your angle.

a) 80°

b) 120°

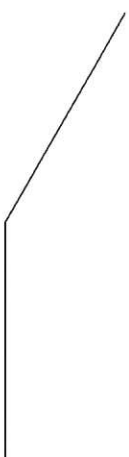
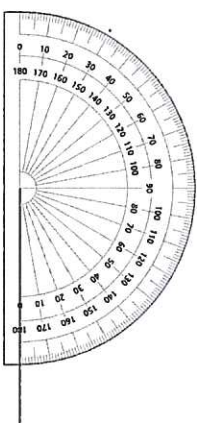
c) 35°

d) 163°



2

Dexter is asked to draw an angle of 30° .
He marks a point as shown.



What mistake has Dexter made?

3

Draw angles of 100° .
Use the given line to form part of the angle.

a)

b)



4

Draw two 45° angles.

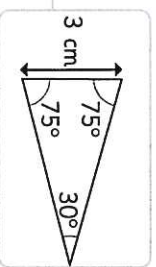
Each angle should be in a different orientation.



5

Esther has sketched a triangle.

Make an accurate drawing of Esther's triangle.



6

Draw the angles.

a) angle $PRQ = 37^\circ$

b) angle $XYZ = 156^\circ$

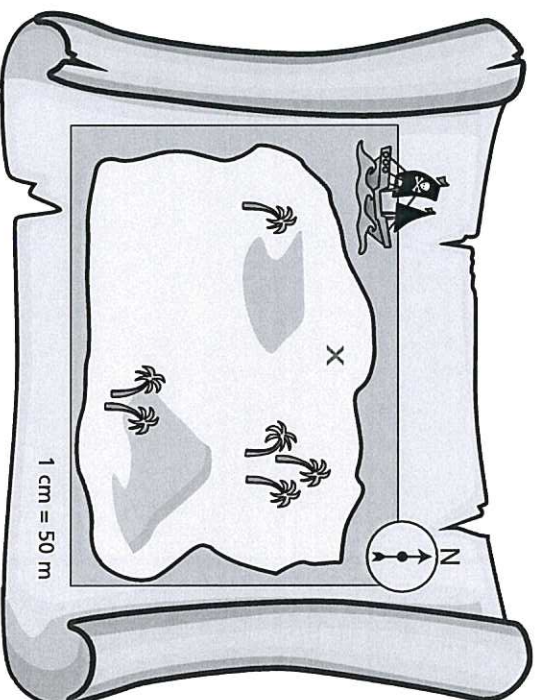


7

Tom is trying to find some treasure.

- He starts at the point marked with a cross.
- He is facing north.
- He turns through 135° clockwise and walks 125 metres.
- He then turns through 135° clockwise and walks 200 metres.
- Tom digs to find the treasure.

Work out where the treasure is.



8

Make your own treasure hunt using the map in question 7. Share it with a partner.

Did your partner find your treasure? Were your instructions correct?



Draw and measure angles between 180° and 360°

1 Measure the angles.

a)



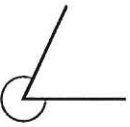
°

d)

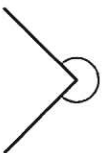


°

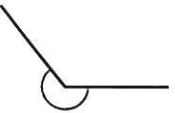
b)



e)



c)



f)



°

°

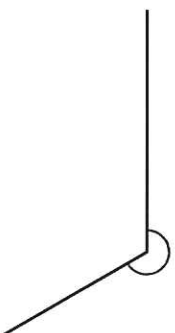
Discuss the method you used with a partner.



2 Whitney is measuring this angle.

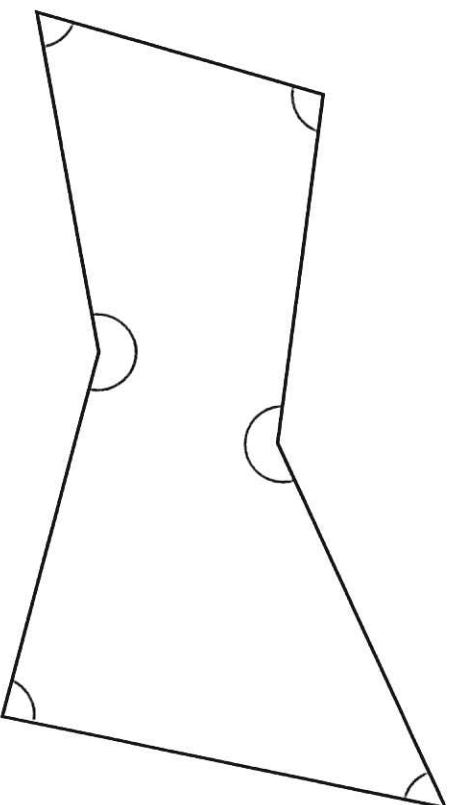


The angle is 120° .



What mistake has Whitney made?

3 Here is an irregular hexagon.

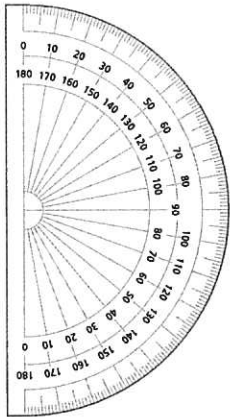


Measure and label the size of all the interior angles of the hexagon.

4



It is not possible to use a protractor to draw angles greater than 180° .



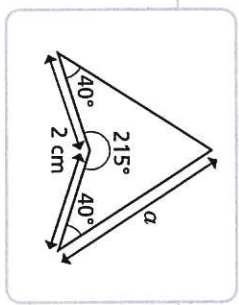
Dexter is incorrect. Talk to a partner about how you can draw an angle of 225° using a protractor.

5

- Draw the angles.
- a) 285°
 - b) 241°
 - c) 354°

6

Make an accurate drawing of the arrowhead.
What is the length of the side marked a ?

 cm


7

- An aircraft takes off from the runway shown in the diagram.
- It flies for 10 miles in the direction shown by the arrow.
 - It then turns clockwise through an angle of 80° .
 - It flies in this direction for 6 more miles.
 - It then turns anticlockwise through 260° degrees and flies for 12 miles.
 - Draw a diagram to show the path of the aircraft.

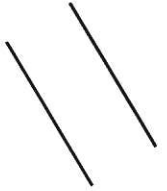
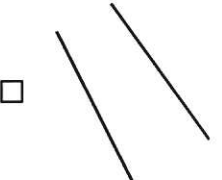
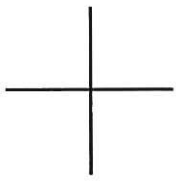
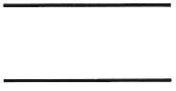


1 cm = 2 miles

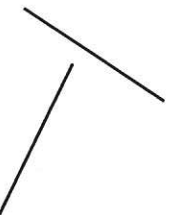
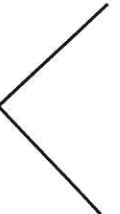
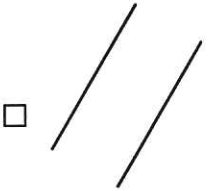
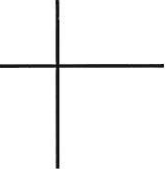
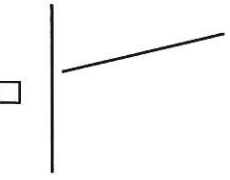
Identify perpendicular and parallel lines



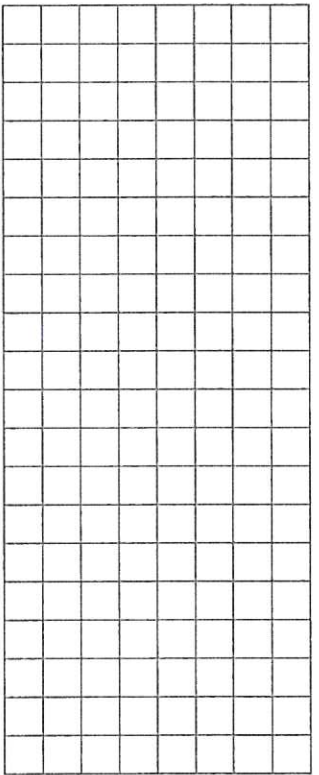
1 Tick the parallel lines.



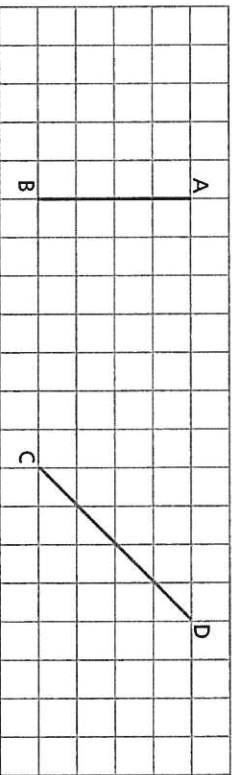
2 Tick the perpendicular lines.



3 On the grid draw two different pairs of parallel lines.



4



- a) Draw a line that is perpendicular to AB.
- b) Draw a line that is perpendicular to CD.

5

These are parallel lines because they never meet.



Do you agree with Dorra? _____
Talk about it with a partner.



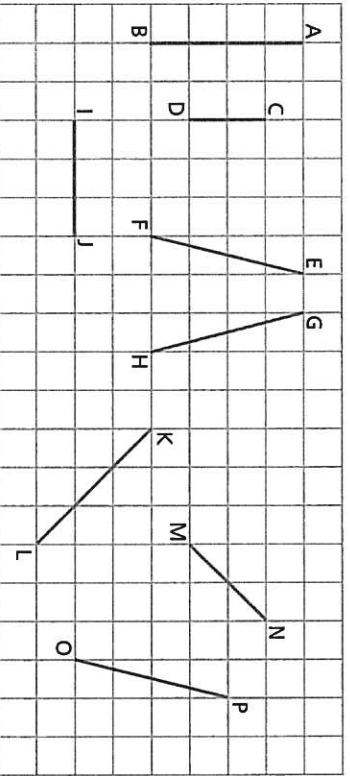
6

- a) Discuss with a partner how you can draw a pair of parallel lines on blank paper.
- b) Draw a pair of parallel lines.



c) Ask your partner to check that the lines are definitely parallel.

7

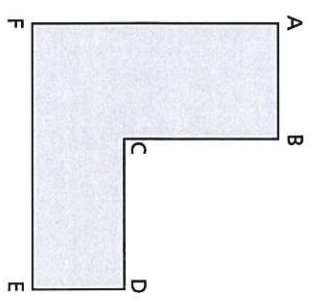


Complete the sentences.

- a) AB is parallel to _____
- b) J is perpendicular to _____ and _____
- c) EF is _____ to _____
- d) KL is _____ to _____



8



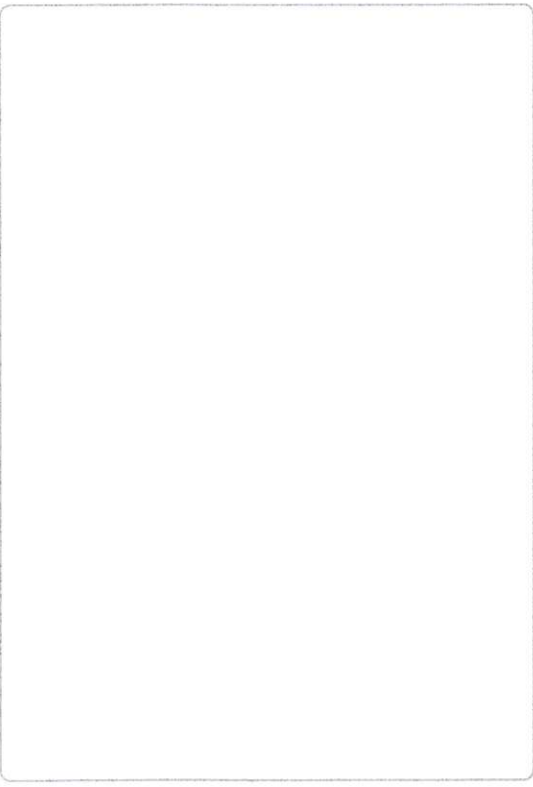
- a) Write the names of all the vertical line segments that are parallel.

- b) Write the names of all the horizontal line segments that are parallel.

- c) Write the names of all the line segments that are perpendicular to FE.

9

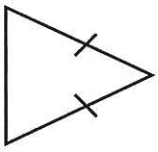
Draw three different shapes that have two pairs of parallel lines.



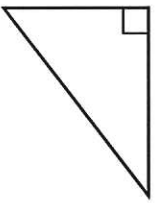
Recognise types of triangle

1 Classify each triangle as equilateral, scalene, right-angled or isosceles.

a)



d)



b)



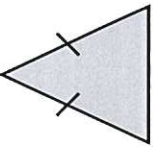
e)



c)



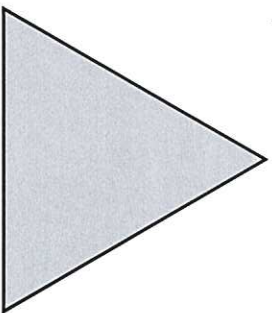
f)



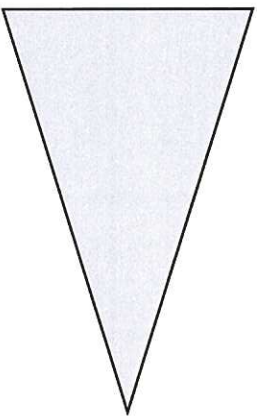
2

Measure and label the angles and side lengths of the triangles. Then classify each triangle as equilateral, scalene, right-angled or isosceles.

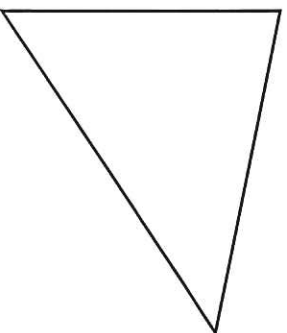
a)



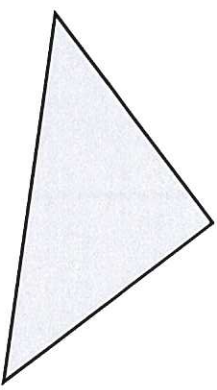
c)



b)



d)



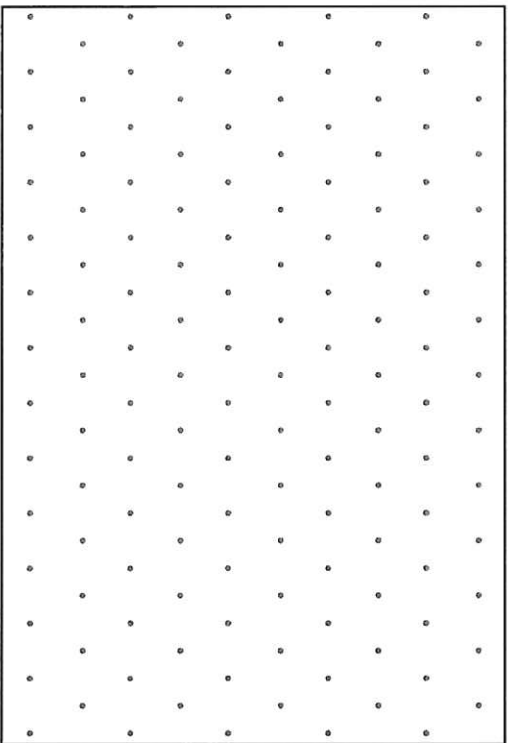
What do you notice about the triangle in part d)?
Talk about it with a partner.



3

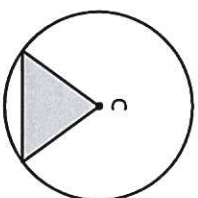
Draw these triangles on the grid.

- a) an equilateral triangle
- b) a right-angled triangle
- c) a scalene triangle
- d) an isosceles triangle



5

Aisha has drawn a triangle inside a circle.



What type of triangle has Aisha drawn?
Explain how you know.

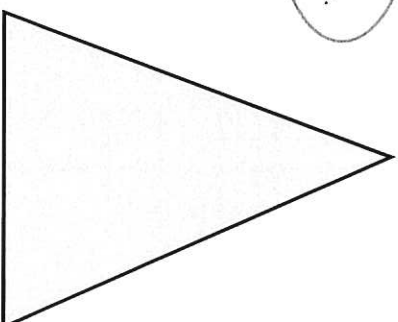


6



This is an
isosceles triangle.

Do you agree with Alex? _____
Use a protractor to measure each
angle to check.

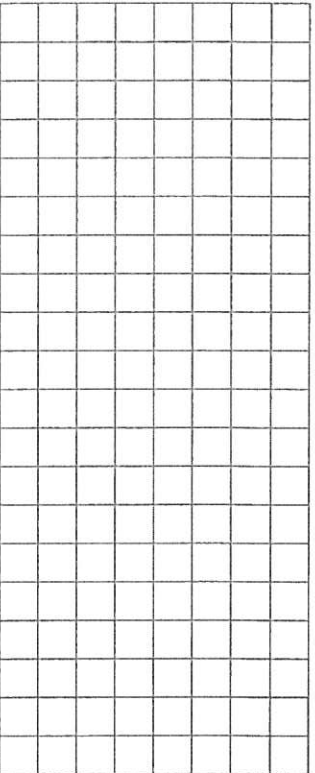


4



A triangle can
either be right-angled or
isosceles. It can't
be both.

Is Tommy correct? _____
Draw a diagram to support your answer.



7

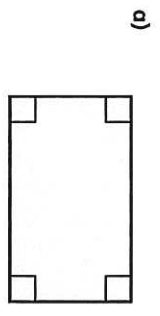
Is the statement true or false?
All triangles have three lines of symmetry.
Explain your answer.

Compare answers with a partner.

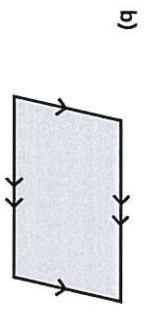


Recognise types of quadrilateral

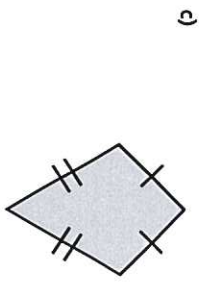
1 Name the quadrilaterals.



d)



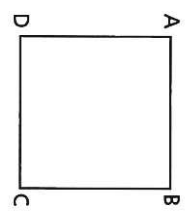
e)



f)

What is the same and what is different about the quadrilaterals?
Discuss with a partner.

2 ABCD is a quadrilateral.

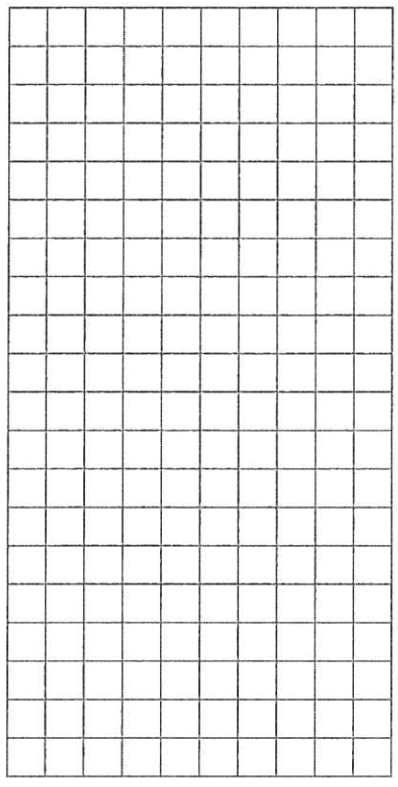


Measure the sides and angles of ABCD and label them on the diagram.

What type of quadrilateral is it? _____

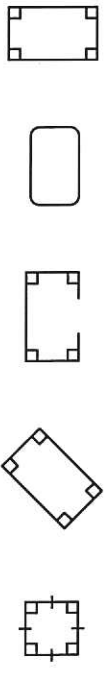
3 Draw and label the shapes on the grid.

- a) rectangle
- b) trapezium
- c) parallelogram



4 a) Write a definition of a rectangle.

b) Tick the rectangles.



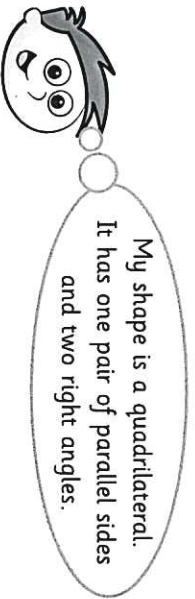
c) Would you now refine your definition? Discuss with a partner.

5

Match the shapes to their properties.

0 pairs of parallel sides	square	0 pairs of equal length sides
1 pair of parallel sides	rectangle	1 pair of equal length sides
2 pairs of parallel sides	parallelogram	2 pairs of equal length sides
	rhombus	4 equal length sides
	kite	
	trapezium	

6



What shape is Teddy thinking of?
 Draw his shape.

7

Is each statement true or false? Explain your answer.

- a) All squares are rectangles. _____
- b) All rectangles are squares. _____
- c) All rectangles are parallelograms. _____

8

Two isosceles triangles are joined to make a quadrilateral.

What quadrilaterals can be formed?
 Draw and label your answers.

9

ABCD is a rectangle.

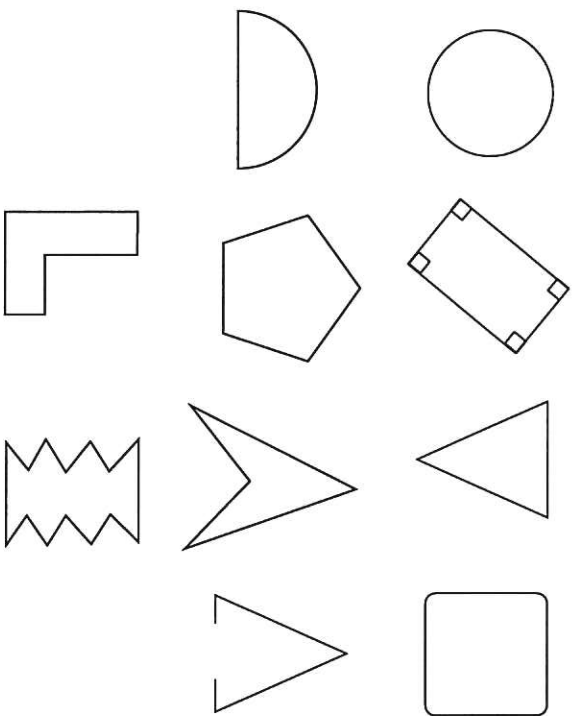
One vertex is moved and ABCD is now a trapezium.

Which vertex could have been moved and in which direction?

Is there more than one answer? Talk about it with a partner.

Identify polygons up to a decagon

1 Here are some shapes.



a) Tick the polygons.

b) For each of the shapes you have not ticked, discuss with a partner why they are not polygons.

c) Write a definition of a polygon in your own words.

2 Match the shape to the number of sides.

quadrilateral	10
nonagon	3
decagon	7
heptagon	9
triangle	4

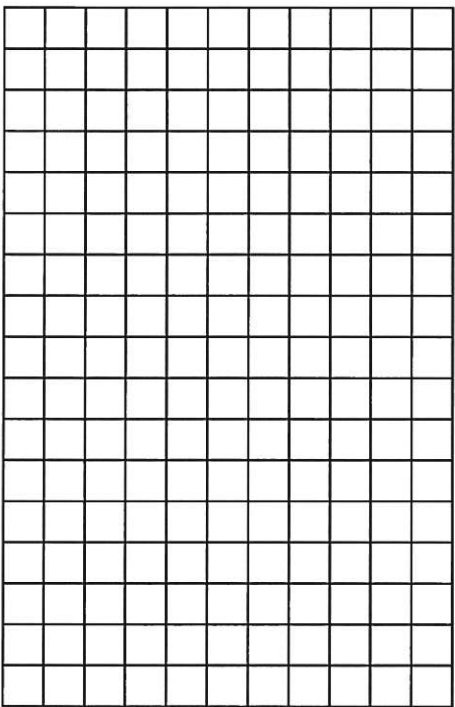
3 Write the name of each polygon.

a)	d)
b)	e)
c)	f)

4

Draw and label each shape on the grid.

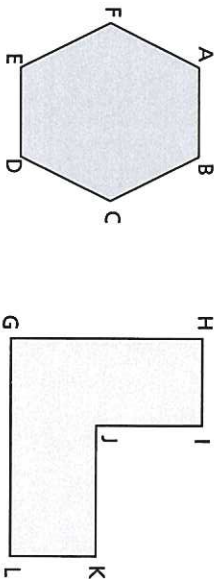
- a) square
- b) hexagon
- c) pentagon
- d) triangle
- e) decagon
- f) heptagon



5

ABCDEF is a regular hexagon.

GHIJKL is an irregular hexagon.



- a) What is the same and what is different about the hexagons?
- b) Write your own definition of a regular polygon.

6

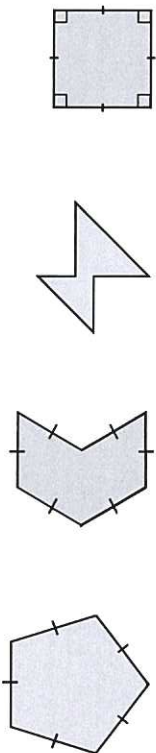
A rhombus is a regular quadrilateral because all of the side lengths are equal.



Do you agree with Annie? _____
 Explain your answer.

7

Tick the polygons that are regular.



Discuss your reasoning with a partner.

8


A pentagon has five sides, so if I join two regular pentagons together I will make a regular decagon.



Do you agree with Mo? _____
 Explain your answer.

Construct triangles using SSS

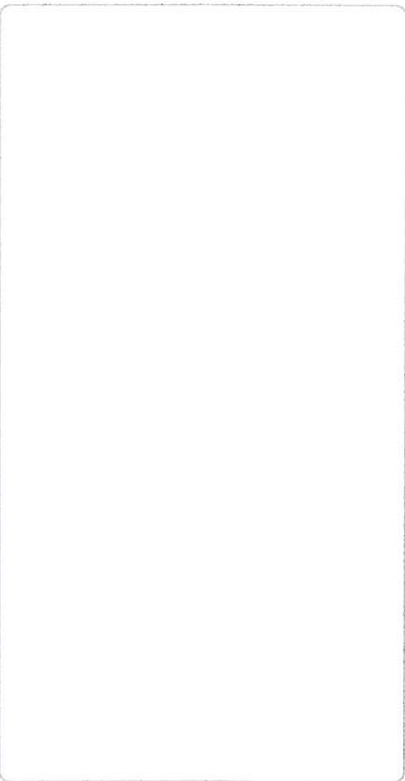
- 1 Use a ruler and a pair of compasses to construct a triangle with side lengths of 7 cm, 6 cm and 4 cm.



Discuss your method with a partner.
Which side did you draw first?

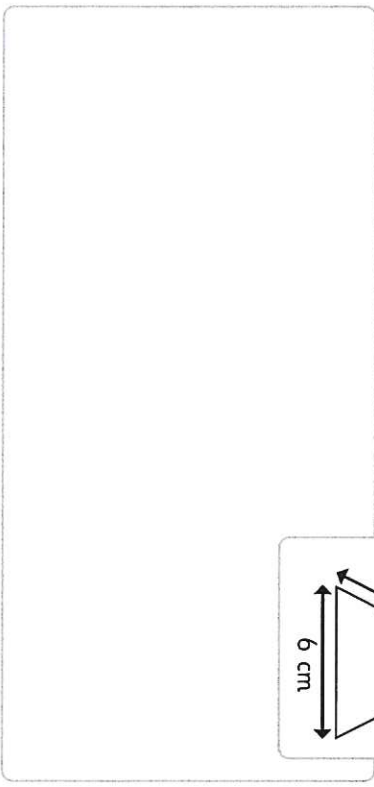
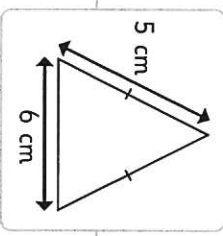


- 2 Construct an equilateral triangle with a side length of 5 cm.



- 3 Eva sketches an isosceles triangle.

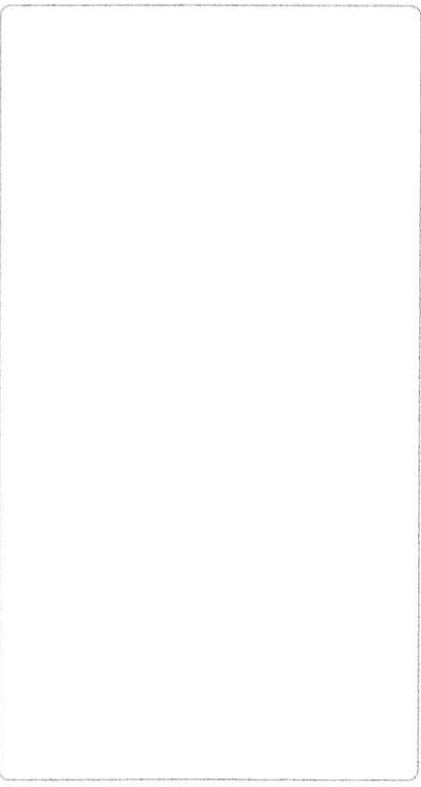
- a) Make an accurate construction of the triangle.



- b) Use the accurate construction to work out the area of the triangle.
Show the steps in your working.

cm²

- 4 Show that a triangle with sides of 3 cm, 4 cm and 5 cm is right-angled.



5

You cannot construct a triangle with sides 8 cm, 4 cm and 3 cm.

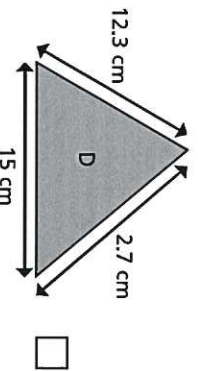
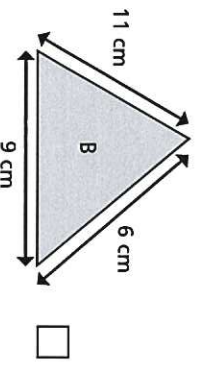
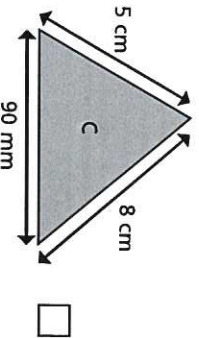
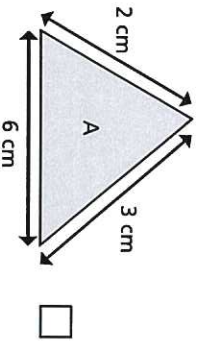


a) Using a ruler and a pair of compasses, show that Jack is correct.



b) Explain why it is not possible to draw this triangle.

c) Tick the triangles with measurements that are not possible.



6

What is the size of the largest angle in a triangle with sides that measure 8 cm, 5.9 cm and 2.4 cm?



7

Construct a triangle that has a perimeter of 15 cm.

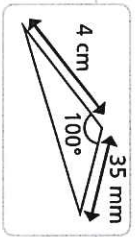
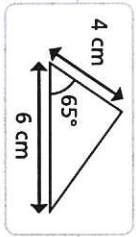


Compare answers with a partner.
How many different triangles can you find?

Construct triangles using SSS, SAS and ASA



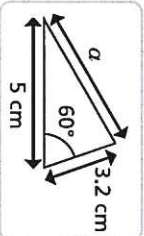
1 Make accurate drawings of the triangles.



Discuss your method with a partner.
Which side did you draw first?

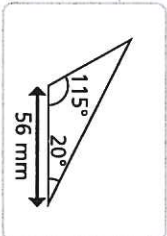
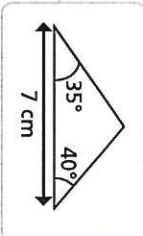


2 By drawing the triangle accurately, find the length of the side marked a .



$a =$ cm

3 Make accurate drawings of the triangles.

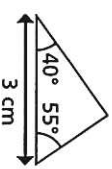
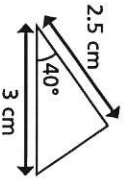


Discuss your method with a partner.



4 Which triangle has the greater perimeter? Tick your answer.

Show all your workings.



5 a) Use the information to construct triangle PQR.

angle PQR = 70° PQ = 8 cm QR = 3.2 cm

b) Measure the length of PR.

Give your answer to 1 decimal place.

cm

6 Describe three different ways to construct an equilateral triangle with a perimeter of 180 mm.

Method 1

Method 2

Method 3

7



Dexter

There is only one triangle that has side lengths 6 cm, 7.5 cm and 9 cm.



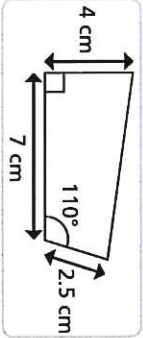
Rosie

There is only one triangle that has angles 70°, 80°, 30°.

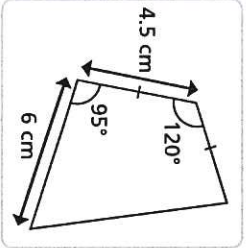
Are Dexter and Rosie both correct? Discuss with a partner.

Construct more complex polygons

1 Make accurate drawings of the shapes.



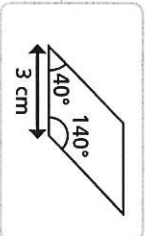
a)



b)

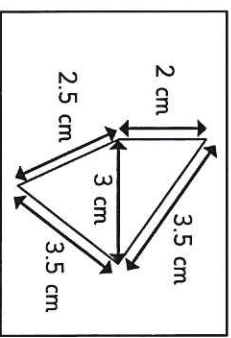


2 Make an accurate drawing of this rhombus.



3 Huan is making the outline of a logo.

Use a ruler and a pair of compasses to make an accurate construction of Huan's logo.



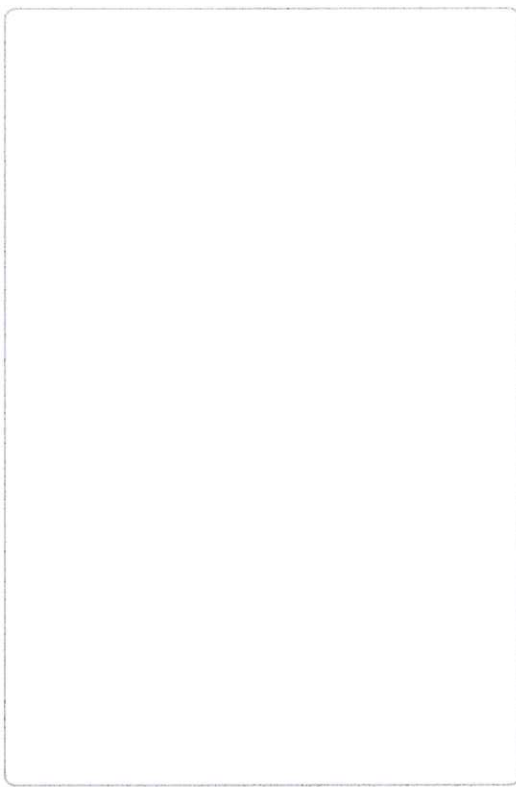
4

Draw a triangle that satisfies the information.

$AB = 8 \text{ cm}$

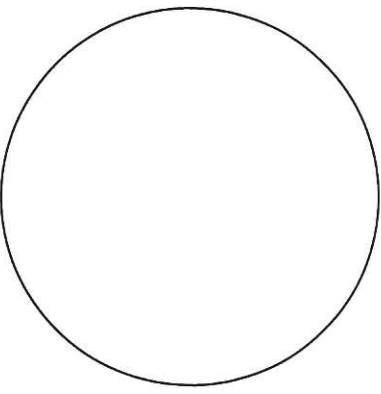
$BC = 6.5 \text{ cm}$

angle $BAC = 50^\circ$



5

Construct a regular hexagon inside the circle.
List all the steps that you took.





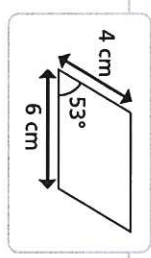
6

a) Write a set of instructions for how to construct a parallelogram.

b) Practise drawing your own parallelograms.

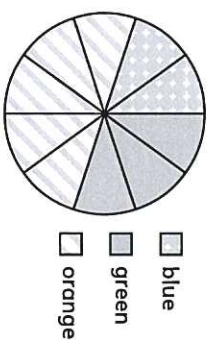


c) Construct this parallelogram.



Interpret simple pie charts using proportion

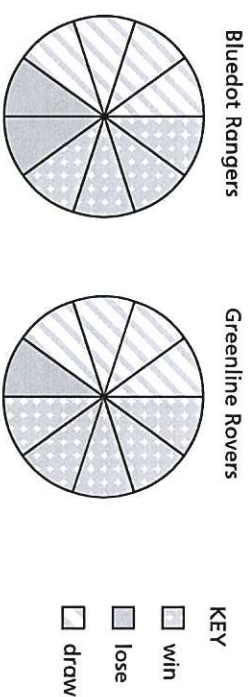
- 1 The pie chart shows the favourite colour of the students in a class.



- a) What was the most popular colour? _____
- b) What was the least popular colour? _____
- c) What fraction of the students chose orange?
Give your answer in its simplest form.
- d) What fraction of the students chose green?
Give your answer in its simplest form.
- e) What fraction of the students chose blue?
Give your answer in its simplest form.
- f) There are 30 students in the class.
How many students does each section of the pie chart represent?
- g) How many students chose blue or orange?

Compare methods with a partner. Did you work this out the same way?

- 2 The pie charts show the proportions of matches that two sports teams won, lost or drew.



Decide if each statement is true or false or whether there is not enough information.

Explain your answers.

- a) Bluedot Rangers and Greenline Rovers played the same number of games.

- b) Bluedot Rangers won and drew an equal number of games.

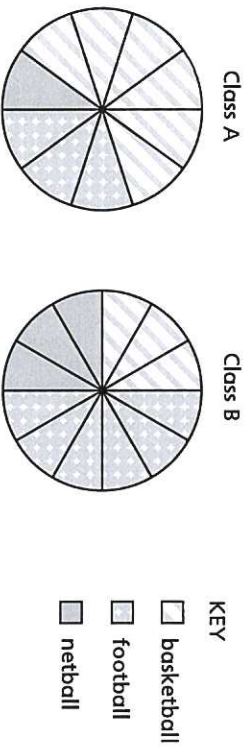
- c) Greenline Rovers won more games than Bluedot Rangers.

- d) Greenline Rovers won a greater proportion of their games than Bluedot Rangers did.

Which team is more successful? Why?

3

Students from two classes were asked to choose their favourite sports. The pie charts show the results.



a) Is this statement true or false?

In class A, twice as many students chose football as chose basketball.

Explain your answer.

b) Is this statement true or false?

In class B, twice as many students chose football as chose basketball.

Explain your answer.

c)

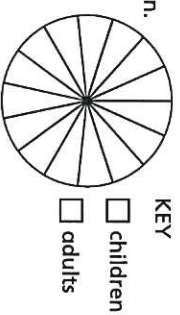


More students like football in class B than in class A.

Do you agree with Whitney? _____
Explain your answer.

4

In a supermarket, $\frac{1}{5}$ of the people are children. The rest are adults.



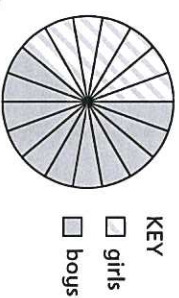
a) Shade the pie chart and complete the key to represent the information.

b) There are 180 adults in the supermarket.

How many children are there?

5

The pie chart shows the proportion of boys and girls in a youth club.



There are 4 more boys than girls in the youth club.

Explain why Amir is wrong.

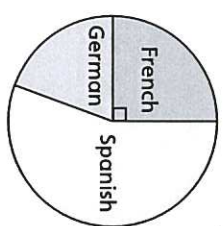
b) There are 20 more boys than girls in the youth club.

How many members of the youth club are there in total?

Interpret pie charts using a protractor

1

Each student in a group studies one language. The pie chart shows the languages they study.



- a) What is the most popular language? _____
- b) What is the least popular language? _____
- c) Dora and Tommy are each writing the fraction of students that study French.

Dora

I think it's $\frac{1}{4}$

Tommy

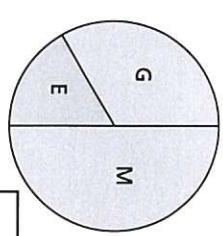
I think it's $\frac{90}{360}$

Who do you agree with? _____
 Explain your answer.



2

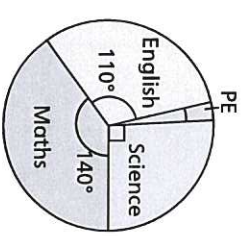
The pie chart shows the proportion of monkeys (M), giraffes (G) and elephants (E) in a zoo.



- a) What fraction of the animals are monkeys?
- b) There are 180 monkeys, giraffes and elephants in total. How many monkeys are there?

3

The pie chart shows the favourite subjects of the students in a class.

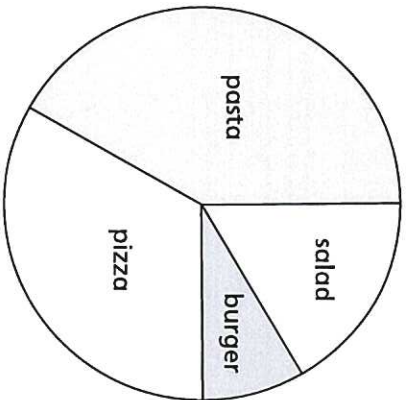


- a) Aisha says, "More students like Maths than like English." Do you agree with Aisha? _____ Explain your answer.
- b) Is this statement true or false? Give reasons for your answer. More students like Maths than the other subjects combined. _____
- c) What fraction of students prefer each subject? Give your answers in their simplest form.
 Science Maths English PE
- d) There are 36 students in the class. How many students said Science was their favourite subject?

4

The pie chart shows the favourite food of 120 people.

The pie chart is drawn accurately.



Food	Frequency
salad	
burger	
pizza	
pasta	

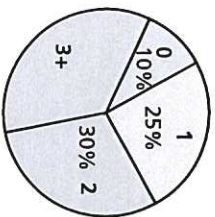
Fill in the frequency table to show how many people chose each food.

5

A group of 500 people were asked how many pets they had.

The pie chart shows the results.

How many more people had 3 or more pets than had 1 pet?



Compare methods with a partner. Did you work it out the same way?

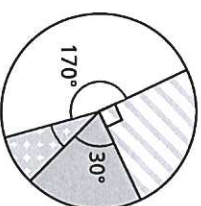
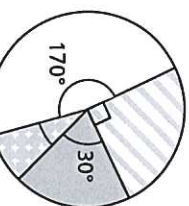
6

Two groups of people were asked to choose their favourite sport.

Group A

Group B

KEY



- tennis
- rugby
- swimming
- football

a) What do you notice about the proportions of people who chose each sport in each group?

b) There were 540 people in group A.

There were three times as many people in group B.

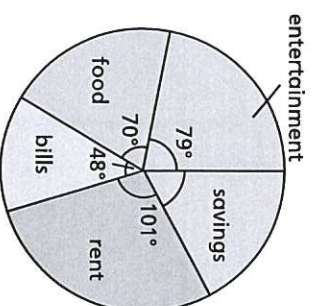
How many people in group B said that tennis was their favourite sport?

7

The pie chart shows how Mr Hall spends his money in a month.

He saves £387.50

How much money does he spend on rent?



Draw pie charts

1

The frequency table shows the favourite colours of a group of children.

Colour	red	blue	green	other
Frequency	18	7	8	3
Angle of sector				

a) Filip is drawing a pie chart to represent the data.

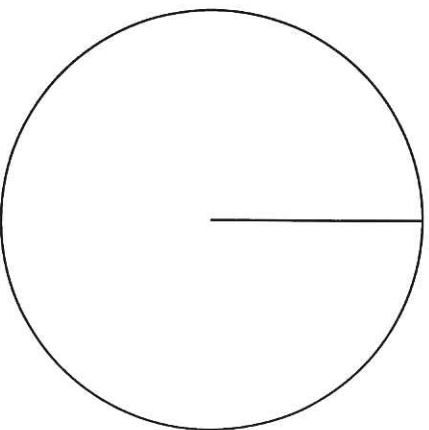
First he needs to work out the angle of each sector.

Here are his workings.

$$\frac{18}{36} = \frac{180}{360} \qquad \text{Angle of sector for red} = 180^\circ$$

Discuss Filip's method with a partner.

- b) Complete the table to show the angle for each sector on the pie chart.
 c) Complete the pie chart.

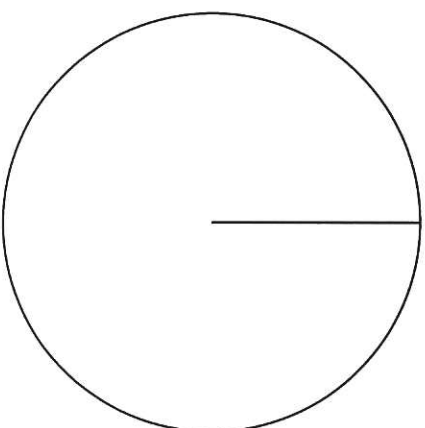


2

The table shows information about how students in Year 7 travel to school.

Complete the table and draw a pie chart to represent the data.

Transport	bus	walk	car	bike
Frequency	31	56	25	8
Angle of sector				

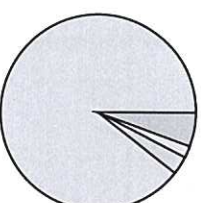


3

The table shows the numbers of wins, losses and draws that a football team had in a season.

Dani has drawn a pie chart to represent the data.

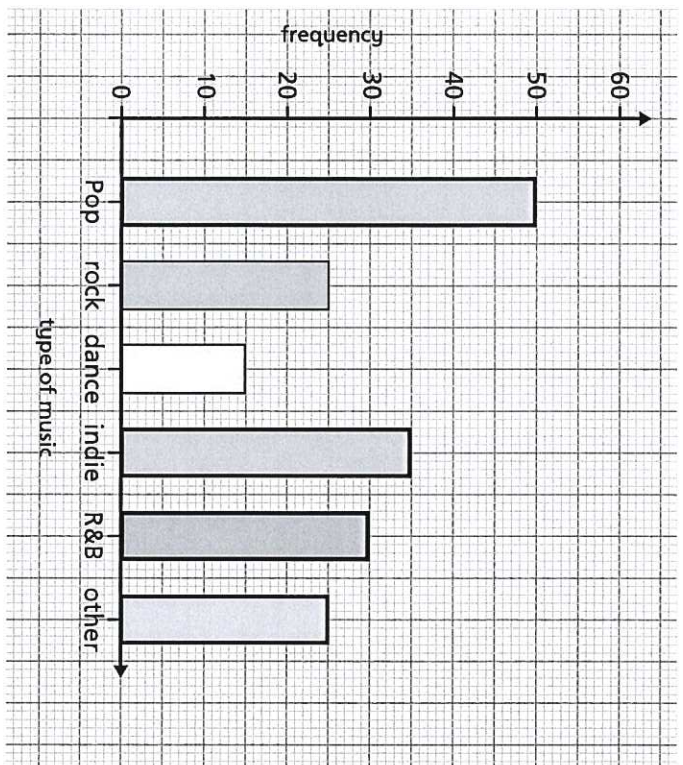
Result	win	loss	draw
Frequency	20	7	11



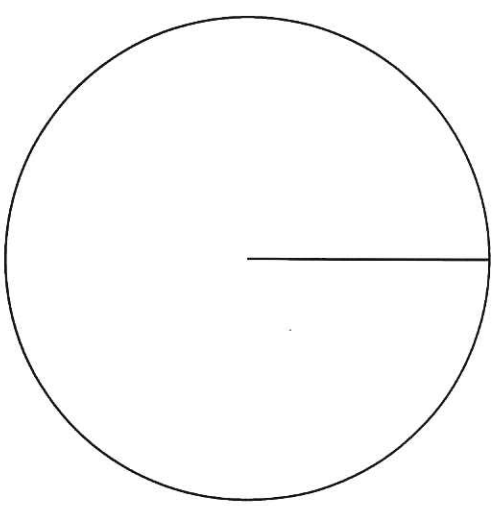
Do you agree with Dani? _____
 Explain your answer.

4

A group of people were asked to vote for their favourite type of music. The results are shown in the bar chart.



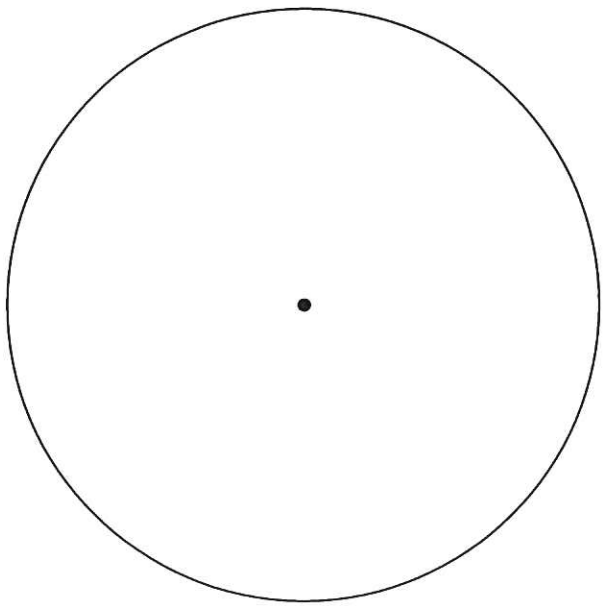
Draw a pie chart to represent the data.



5

A group of 45 people were asked to choose their favourite activity. Complete the table and draw a pie chart to represent the data.

Result	Frequency	Angle of sector
read	17	
draw		32°
play sport		
play computer games		48°
other	9	



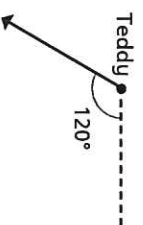
Understand and use the sum of angles at a point

1 a) How many degrees are in a full turn?

b) Teddy is facing forward.



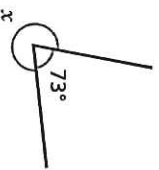
He turns through 120° .



How many more degrees does he need to turn through to get back to his starting point?

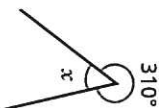
2 Find the size of angle x .

a)



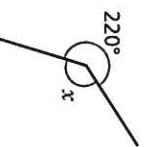
$x =$

b)



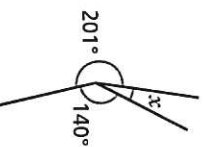
$x =$

c)



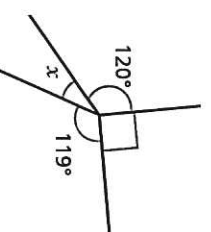
$x =$

d)



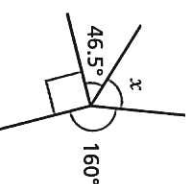
$x =$

e)



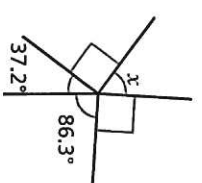
$x =$

f)

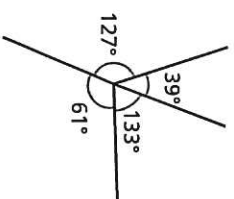


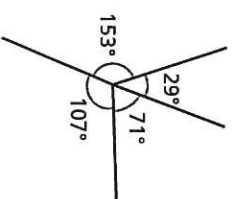
$x =$

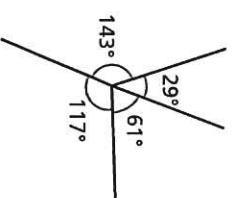
3 Tick the correct diagram.



$x =$



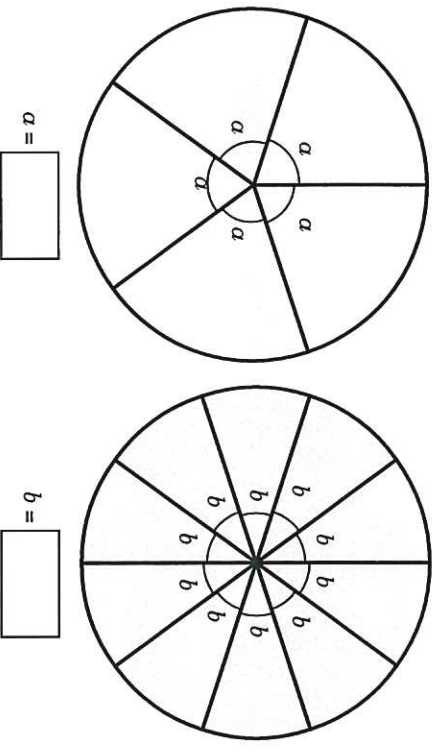




Explain your choice.

4

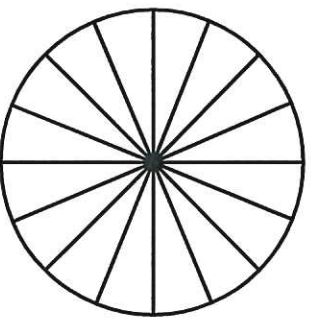
a) Find the sizes of angles a and b .



Discuss with a partner how you worked them out.

b) Annie draws a pie chart.

She splits it into 16 equal sectors.
What is the angle of each sector?

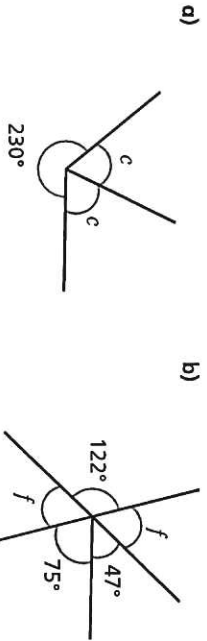


c) Annie's pie chart represents 800 students.
How many students are represented in 5 of the sections?

 students

5

Work out the sizes of the unknown angles.



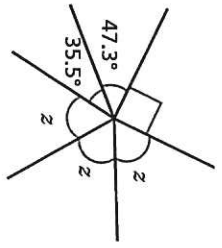
c =

f =

Compare your method with a partner's.

6

Form and solve an equation to find the size of angle z .



z =

7

Four line segments are drawn from a point O.

They are OP, OQ, OR and OS.

P, Q, R and S are points drawn clockwise in order around O.

Angle SOR is 91° .

Angle POQ is 26° more than angle SOR.

Angle QOR is a right angle.

Four children have worked out the size of angle SOP.

Who is correct? Tick your answer.

Tom 243°

Whitney 153°

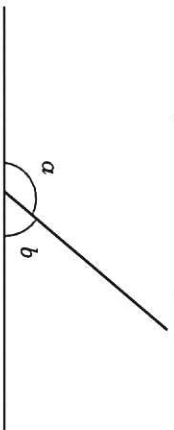
Esther 152°

Amir 62°

Explain the mistakes that the others have made.

Understand and use the sum of angles on a straight line

1 Two angles, a and b , are adjacent on a straight line.



a) Measure angles a and b .

$a =$

$b =$

b) What is the total of the two angles?

c) Complete the sentence.

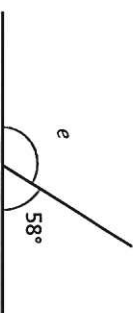
Adjacent angles on a straight line _____

2 Tick the diagram that shows adjacent angles on a straight line.



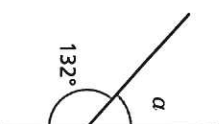
3 Work out the unknown angles.

a)



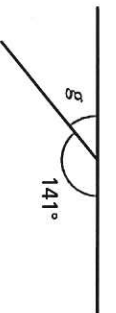
$e =$

d)



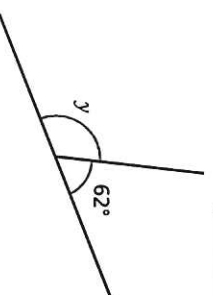
$a =$

b)



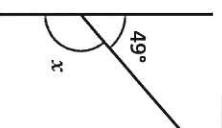
$g =$

e)



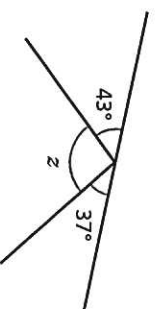
$y =$

c)



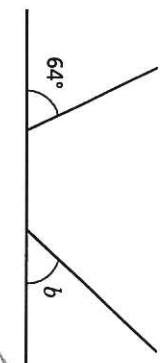
$x =$

f)



$z =$

4



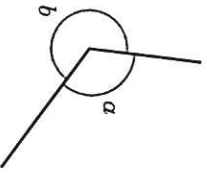
Angle b is 116° because angles on a straight line add up to 180° .



Do you agree with Tommy? _____
Explain your answer.

5 Use the information to work out the unknown angles.

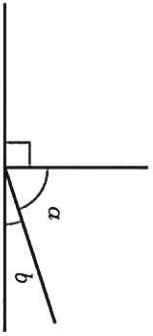
a) Angle α is half the size of angle b .



$\alpha =$

$b =$

b) Angle α is four times the size of angle b .



$\alpha =$

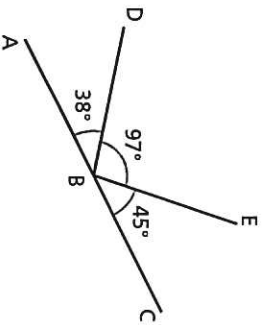
$b =$

6 a) Write the size of the given angles.

ABD

EBC

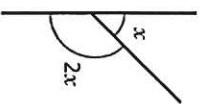
DBE



b) Is ABC a straight line? _____
How do you know?

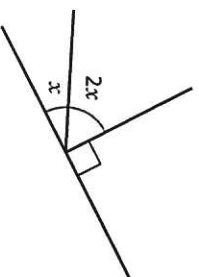
7 Work out the value of x .

a)



$x =$

b)

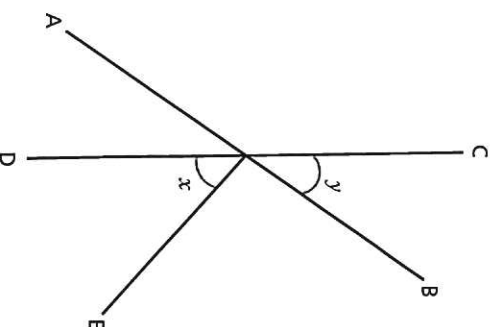


$x =$

Compare methods with a partner.

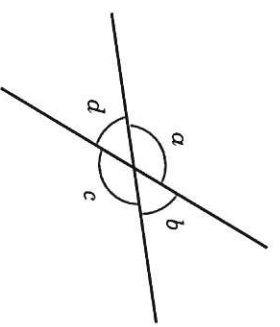
8 AB and CD are straight lines.

Write expressions for the sizes of any missing angles and label them on the diagram.



Understand and use the equality of vertically opposite angles

1 The diagram shows four angles around a point.



a) What is the sum of all four angles?
How do you know?

b) Which pairs of angles sum to 180° ?

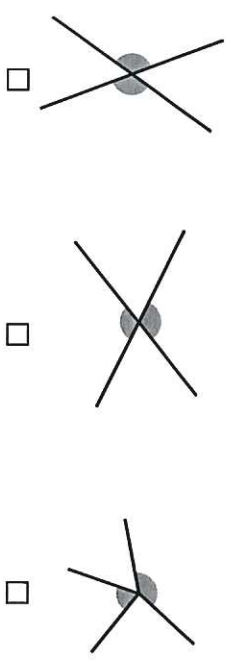
How do you know?

c) Which pairs of angles are equal?

How do you know?

d) Complete the sentences.
Angles round a point _____
Adjacent angles on a straight line _____
Vertically opposite angles _____

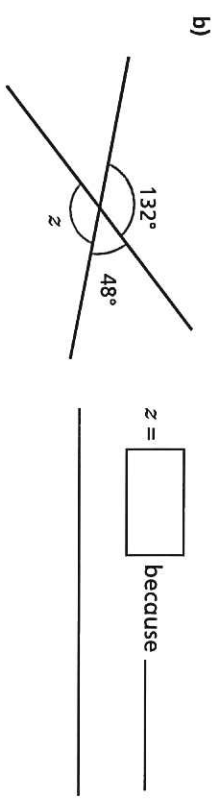
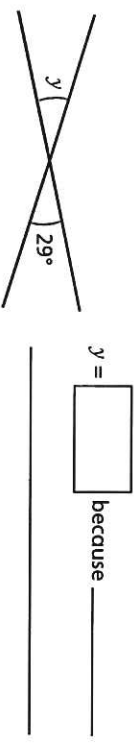
2 Tick the pairs of angles that are vertically opposite.



Compare answers with a partner.

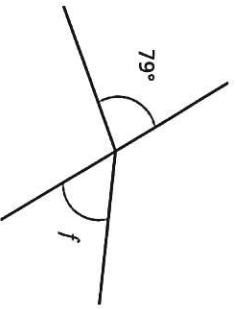
3 Work out the sizes of the unknown angles.

Give reasons for your answers.



4

Whitney is working out the size of angle f .



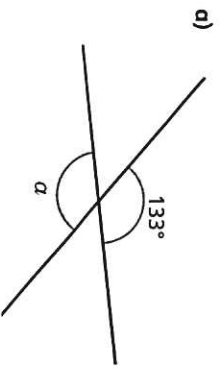
Angle f is equal to 79° because vertically opposite angles are equal.



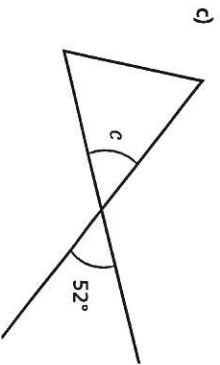
Do you agree with Whitney? _____
 Explain your answer.

5

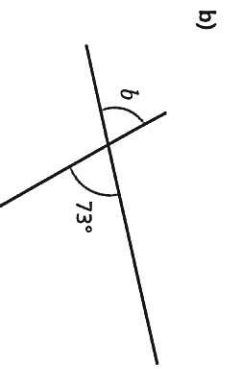
Work out the unknown angles.



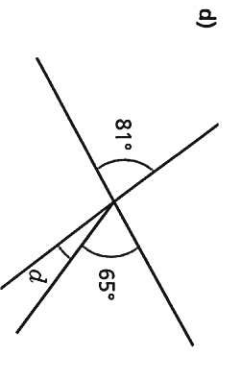
$a =$



$c =$

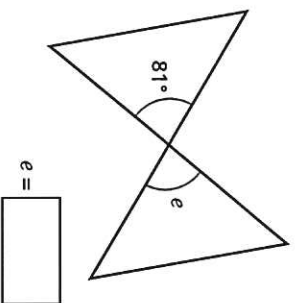


$b =$



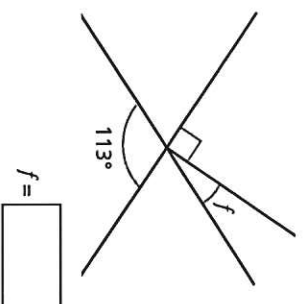
$d =$

e)



$e =$

f)

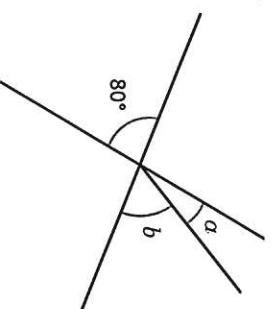


$f =$

Talk about your reasons with a partner.

6

Angle b is three times the size of angle a .



Work out the sizes of angles a and b .

$a =$

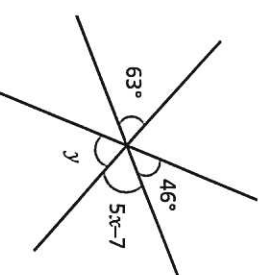
$b =$

7

The diagram shows three straight lines intersecting at a single point. Work out the value of x and y .

$x =$

$y =$



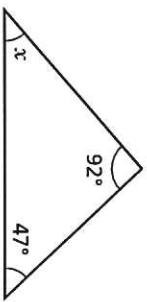
Know and apply the sum of angles in a triangle

1

Work out the sizes of the unknown angles.

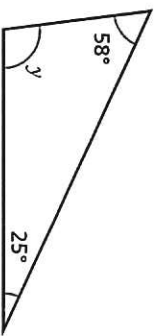
Give reasons for your answers.

a)



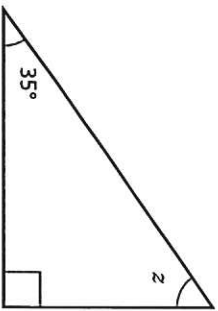
$x = \square$ because _____

b)



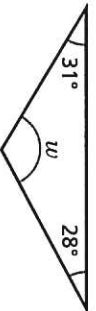
$y = \square$ because _____

c)



$z = \square$ because _____

d)

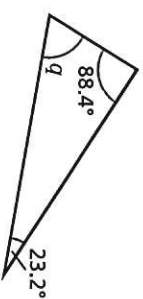


$w = \square$ because _____

2

Work out the unknown angles.

a)



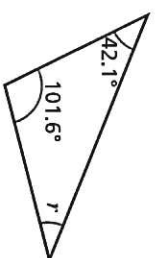
$q = \square$

c)



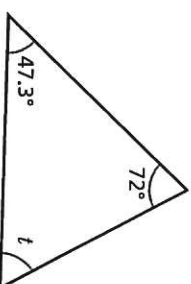
$s = \square$

b)



$r = \square$

d)



$t = \square$

Discuss your reasons with a partner.

3

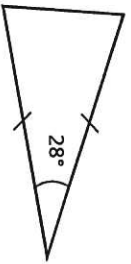
a) Two angles in a triangle are 42° and 57° . What is the size of the third angle?

b) Two of the angles in a triangle are 12° . What is the size of the third angle?

c) One of the angles in a triangle is 38° . Another angle is twice the size of the first angle. What is the size of the third angle?

4

Dexter is working out the unknown angles in triangles.



I can't work out either of the missing angles because I don't have enough information.

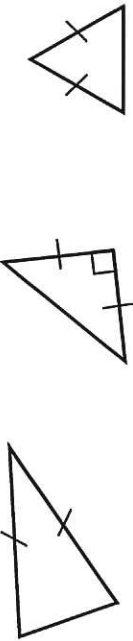
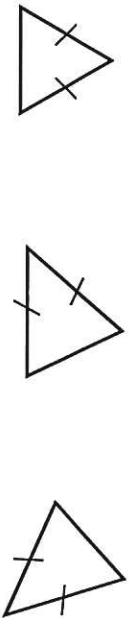


Do you agree with Dexter? _____

Explain your answer.

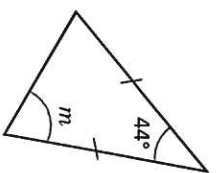
5

Identify and label the angles that will be equal in each triangle.



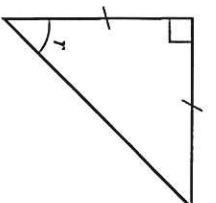
6

Work out the sizes of the unknown angles.



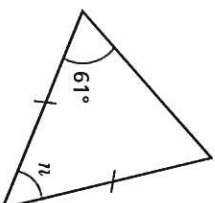
a)

c)



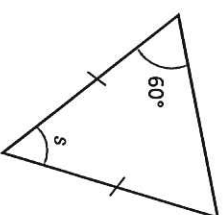
b)

d)



$m =$

$n =$



$r =$

$s =$

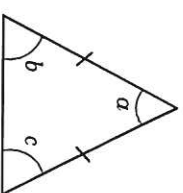
What type of triangle is the triangle in part d)?
Talk about it with a partner.

7

One angle in an isosceles triangle is 29° .
What could the other angles be? Give two possible answers.

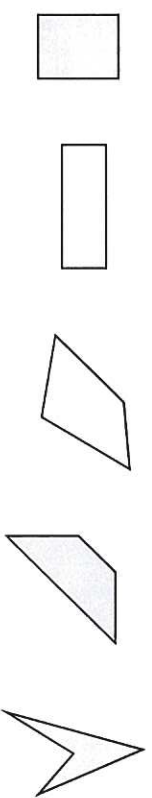
8

Angle b is twice the size of angle a .
Work out the size of angle c .



Know and apply the sum of angles in a quadrilateral

1 Here are some quadrilaterals.



a) For each quadrilateral, choose one vertex and join it to each other vertex in the shape using straight lines.

This will split each quadrilateral into triangles.

b) How many triangles has each quadrilateral been split into?

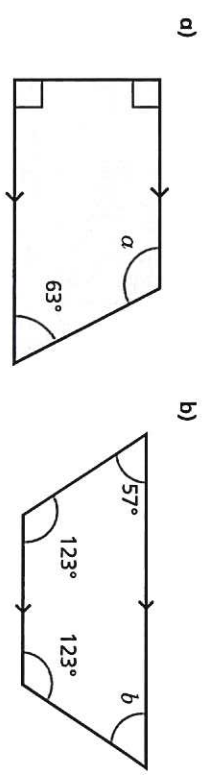
c) What is the sum of the angles in a triangle?

d) Complete the sentence.
Angles in a quadrilateral sum to

2 Jack is working out the sum of the interior angles of a parallelogram.

Do you agree with Jack? _____
Explain your answer.

3 Work out the size of the unknown angle in each trapezium.

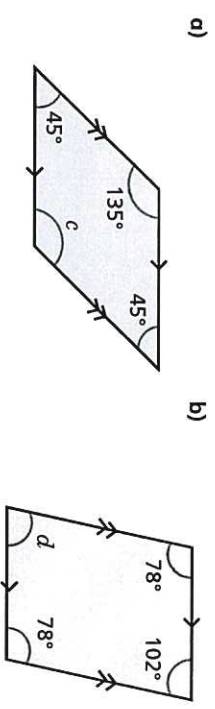


$a =$

$b =$

c) What is the same and what is different about the trapeziums?

4 Work out the sizes of the unknown angles in the parallelograms.



$c =$

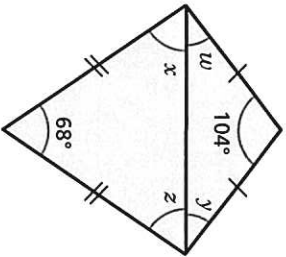
$d =$

c) What do you notice about opposite angles in a parallelogram?

5

Two isosceles triangles are joined to form a kite.

a) Work out the sizes of the unknown angles.



$w =$

$y =$

$x =$

$z =$

b) Work out $w + x$.

c) Work out $y + z$.

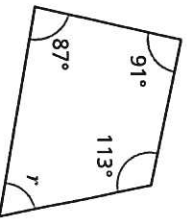
What do you notice? Talk about it with a partner.



6

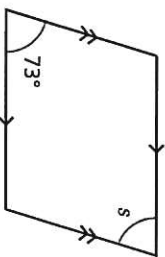
Work out the sizes of the unknown angles.

a)



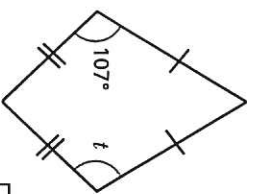
$r =$

b)



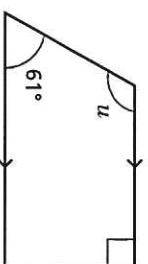
$s =$

e)



$t =$

d)



$u =$

Compare your reasoning with a partner.

7

Dora is drawing a quadrilateral.

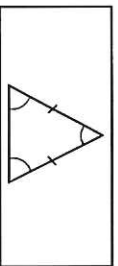
My quadrilateral has exactly three right-angles.



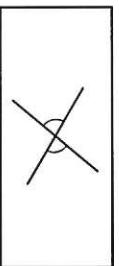
Is Dora's quadrilateral possible? _____
Explain your answer.

Solve angle problems using properties of triangles and quadrilaterals

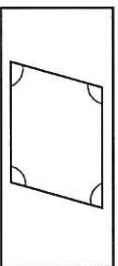
1 Match each diagram to the correct rule.



Angles on a straight line sum to 180°



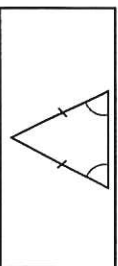
Angles around a point sum to 360°



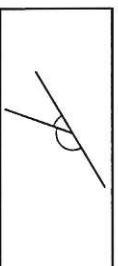
Angles in a triangle sum to 180°



In an isosceles triangle, two angles are equal

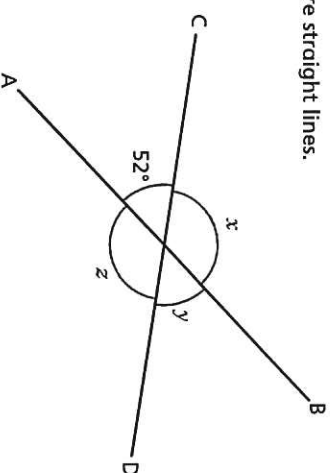


Vertically opposite angles are equal



Angles in a quadrilateral sum to 360°

2 AB and CD are straight lines.



Work out the sizes of angles x , y and z . Give reasons for your answers.

$x =$ because _____

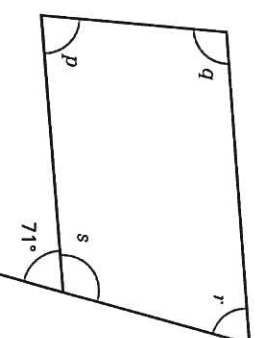
$y =$ because _____

$z =$ because _____

Compare your reasons with a partner.

Did you work out each angle in the same way?

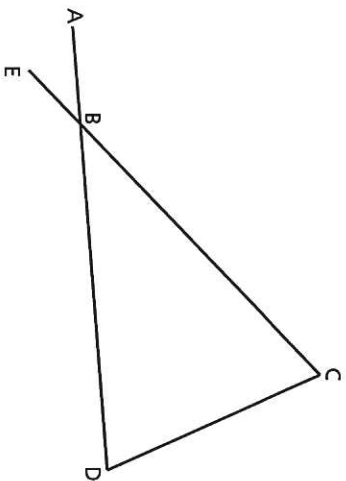
3 Here is a quadrilateral.



a) Work out the size of angle s . Give a reason for your answer.

$s =$ because _____

b) What is the sum of angles q , r and p ?
How do you know?



- a) Angle ABE is 39° .

Label it on the diagram.

- b) What is the size of angle ABC?

How do you know?

- c) What is the size of angle CBD?

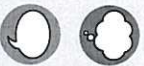
How do you know?

- d) What is the sum of angles BCD and CDB?

How do you know?

- e) Angle BCD is 70° . Is triangle BCD isosceles? _____

Discuss with a partner.



Complete the sentence for each diagram.

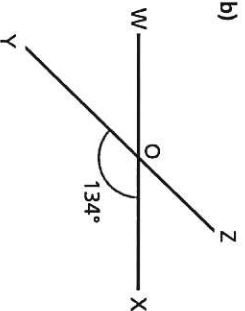
You must use correct mathematical vocabulary.

- a)



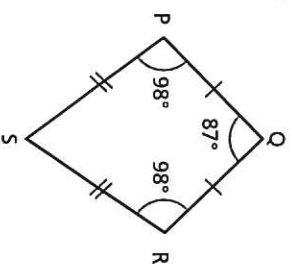
Angle ACD is because _____

- b)



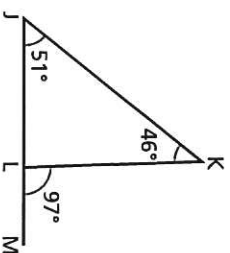
Angle is 134° because _____

- c)



Angle PSR is because _____

- d)



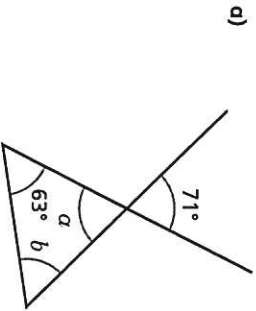
Angle is 83° because _____

_____ or _____

Solve complex angle problems

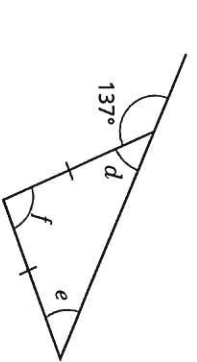
1 Work out the sizes of the unknown angles.

Give reasons for each stage of your working.



$\alpha =$ because _____

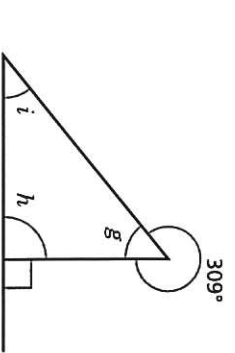
$b =$ because _____



$d =$ because _____

$e =$ because _____

$f =$ because _____

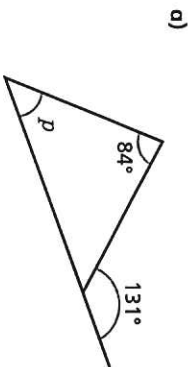


$g =$ because _____

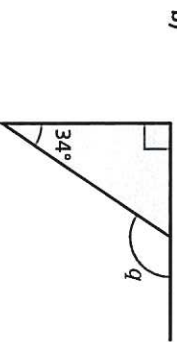
$h =$ because _____

$i =$ because _____

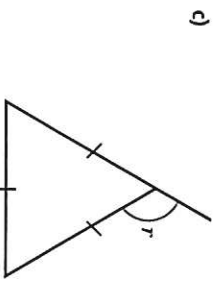
2 Work out the sizes of the unknown angles.



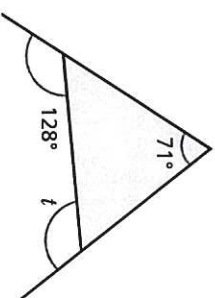
$p =$



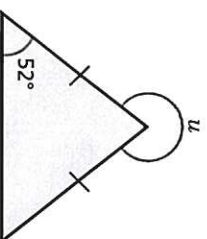
$q =$



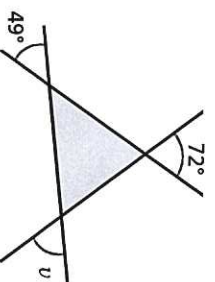
$r =$



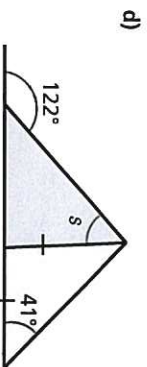
$t =$



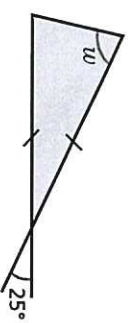
$u =$



$u =$



$s =$



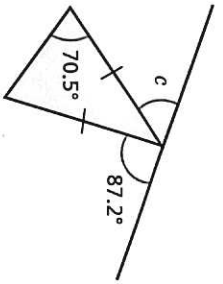
$w =$

Talk about your reasons with a partner.

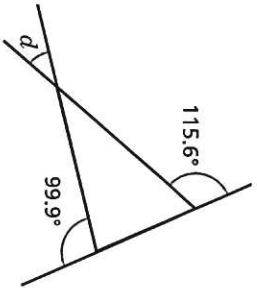


3 Work out the sizes of the unknown angles.

a) b)

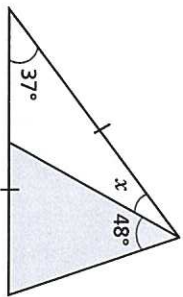


$c =$



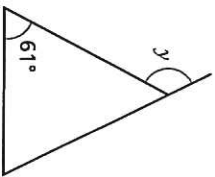
$d =$

4 Work out the size of angle x .



$x =$

5 Here is an isosceles triangle. Find two possible sizes of angle y .

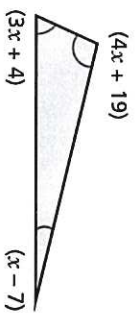
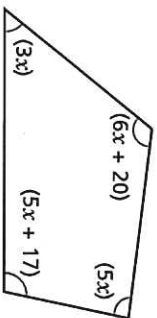


$y =$ or

6 Form and solve equations to work out the value of x in each diagram.

Show each step of your workings.

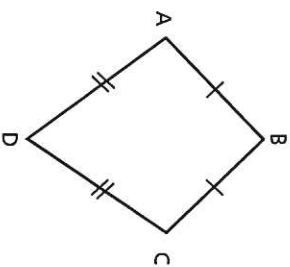
a) b)



$x =$

$x =$

7 ABCD is a kite.



a) Estimate the size of each angle in the kite.

$\angle ABC =$

$\angle BCD =$

$\angle CDA =$

$\angle DAB =$

b) Given that $p = 20$, write a possible expression for the size of each angle in terms of p .

$\angle ABC =$ _____

$\angle BCD =$ _____

$\angle CDA =$ _____

$\angle DAB =$ _____

Compare answers with a partner.

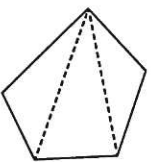
Find and use the angle sum of any polygon

H

1 The sum of the interior angles of a triangle is 180° .

Split the polygons into triangles to work out the sum of their interior angles. Your lines should not overlap.

The first one has been done for you.



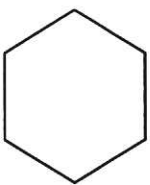
a)

number of sides = 5

number of triangles = 3

$3 \times 180 = 540$

The sum of the interior angles of a pentagon is 540°



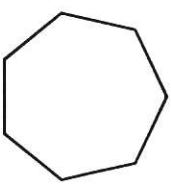
b)

number of sides =

number of triangles =

$\times 180 =$

The sum of the interior angles of a hexagon is



c)

number of sides =

number of triangles =

$\times 180 =$

The sum of the interior angles of a heptagon is

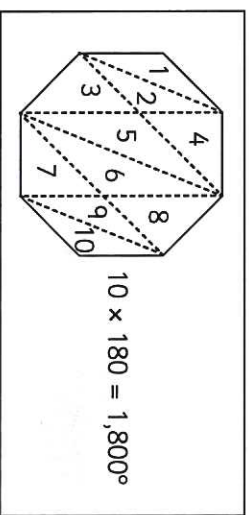
What do you notice about the number of sides compared to the number of triangles?

2 Complete the table.

Shape	Number of sides	Number of triangles	Sum of interior angles
quadrilateral	3	2	360°
pentagon			
nonagon			
decagon	6		
		6	
			$1,800^\circ$

Compare answers with a partner.

3 Dani is working out the sum of the interior angles of a polygon. Here are her workings.



Do you agree with Dani? _____
Explain your answer.

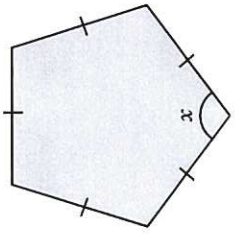
4 A polygon has n sides.

a) Write an expression in terms of n for the number of triangles inside the shape.

b) Write an expression in terms of n for the sum of the interior angles of the polygon.

5

Work out the size of angle x in the regular polygons.

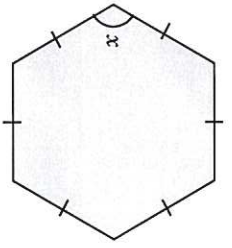


number of sides =

sum of interior angles =

\div 5 =

$x =$

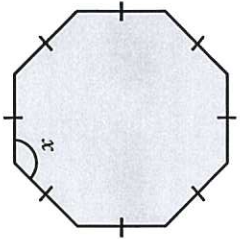


number of sides =

sum of interior angles =

\div =

$x =$

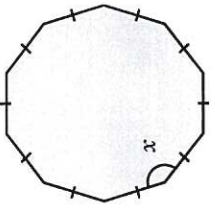


number of sides =

sum of interior angles =

\div =

$x =$



number of sides =

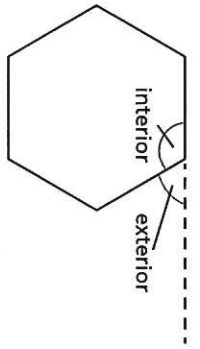
sum of interior angles =

\div =

$x =$

6

The diagram shows an interior angle of a regular hexagon and its adjacent exterior angle.



- a) What is the size of the interior angle of the hexagon?
- b) What is the size of the exterior angle?
- Give a reason for your answer.
- _____

7

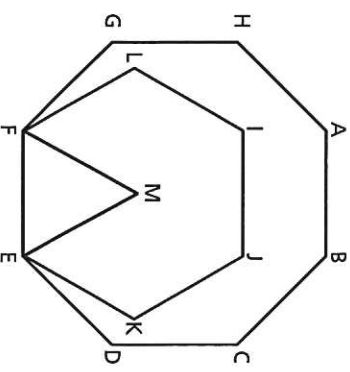
A regular polygon has 24 sides.

- a) Work out the size of each interior angle.
- b) Work out the size of each exterior angle.

8

The diagram is made up of regular polygons.

Work out the size of as many angles as you can.
Record your answers using correct angle notation.



Compare answers with a partner.

Investigate angles in parallel lines

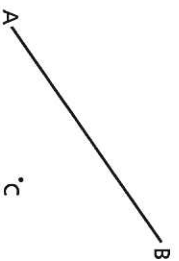
H

1 For each diagram, draw a line segment that is parallel to AB and goes through point C.

a) Draw on the diagrams to indicate that the lines are parallel.

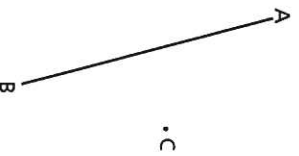


c

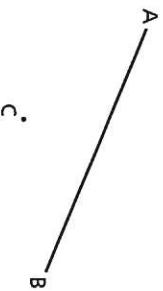


c)

b)

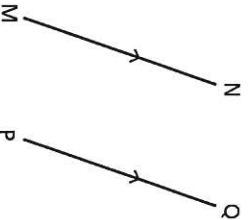


d)



2 Line segments MN and PQ are parallel. Draw a transversal that cuts through the parallel lines and goes through point R.

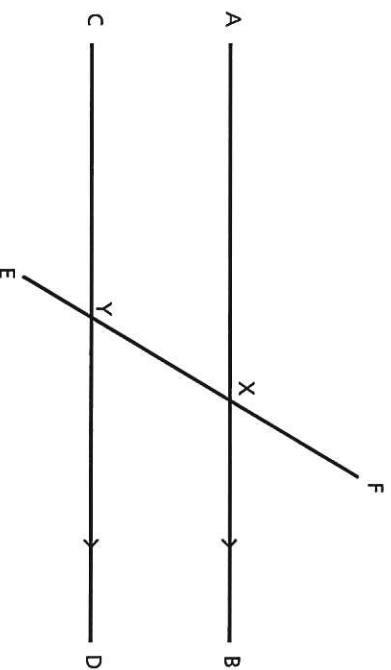
R



3

Line segments AB and CD are parallel.

Line segment EF is a transversal that intersects the line segments at points X and Y respectively.



a) Measure the size of each angle.

$\angle AXF =$ <input type="text"/>	$\angle BXF =$ <input type="text"/>
$\angle AXE =$ <input type="text"/>	$\angle BXE =$ <input type="text"/>
$\angle CYF =$ <input type="text"/>	$\angle DYF =$ <input type="text"/>
$\angle CYE =$ <input type="text"/>	$\angle DYE =$ <input type="text"/>

Compare answers with a partner.
What do you notice?

b) Complete the sentences.

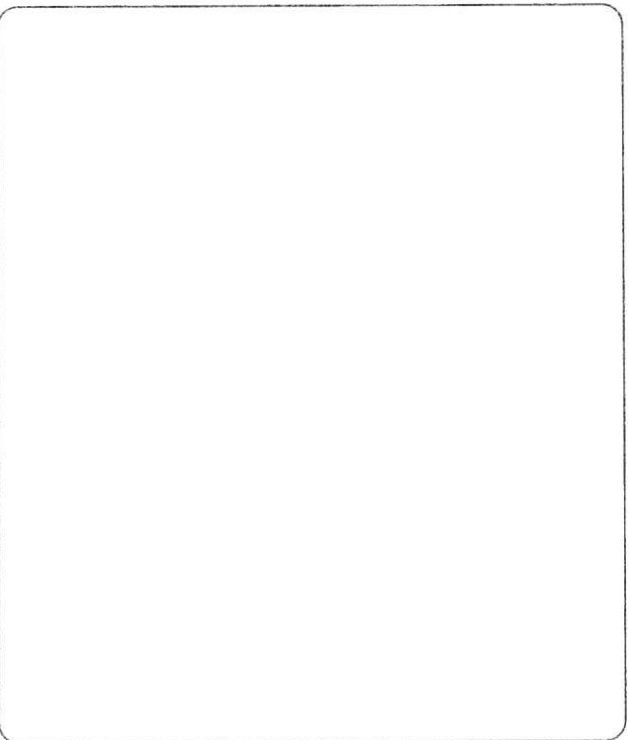
- Angle AXE is alternate to angle _____
- Angle AXE is corresponding to angle _____
- Angle BXF is corresponding to angle _____
- Angle CYF is alternate to angle _____

4

Line segments QR and ST are parallel.

Line segment UV is a transversal that intersects the line segments at points X and Y respectively.

a) Draw a diagram to represent this.



Compare your diagram with a partner's diagram.

Do they look the same? Does it matter? Why?

b) Eight angles are formed. Measure the size of each angle and label them on the diagram.

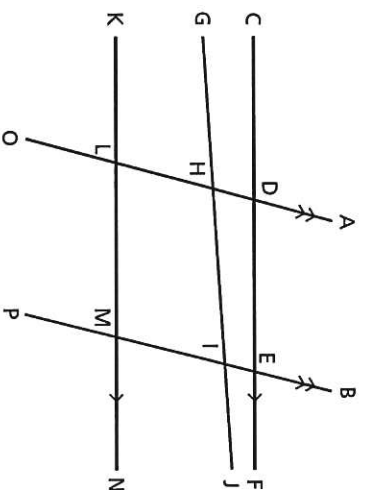
Compare answers with a partner.

What is the same and what is different?

c) Identify two pairs of alternate angles and two pairs of corresponding angles.

What do you notice?

5



a) Complete the sentence in two ways.

Line segments _____ and _____ are parallel.

Line segments _____ and _____ are parallel.

b) Complete the sentence.

GJ is a _____ that intersects the line segments _____ and _____.

c) Identify four pairs of alternate angles.

d) Identify four pairs of corresponding angles.

e)

Angles GHO and ALN are alternate angles.



Do you agree with Doro? _____

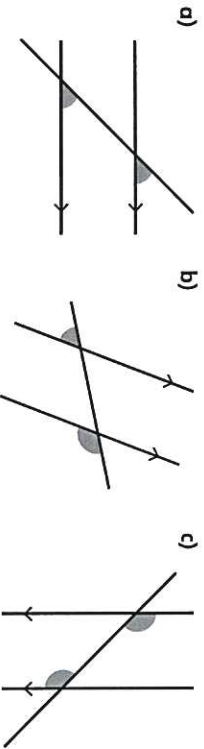
Explain your answer.

Understand and use parallel line angle rules

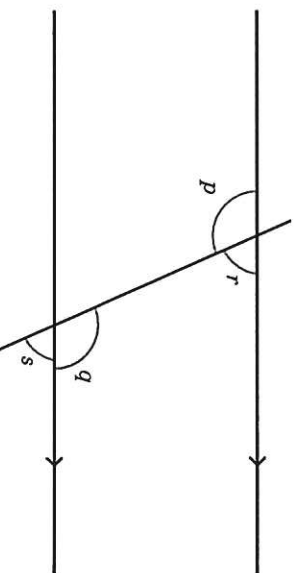
H



1 Are the pairs of angles alternate, corresponding or neither?



2 Four angles are labelled on the diagram.



a) p and q are alternate angles. Measure the size of each angle and label them on the diagram.

What do you notice?

b) Complete the sentence.

Alternate angles are _____

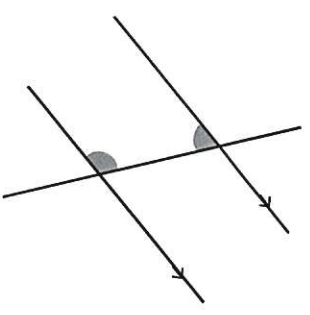
c) r and s are corresponding angles. Measure the size of each angle and label them on the diagram.

What do you notice?

d) Complete the sentence.

Corresponding angles are _____

3 A pair of co-interior angles are shown on the diagram.



a) Measure the size of each angle. Label them on the diagram.

What do you notice?

b) Complete the sentence.

Co-interior angles _____

4 Complete the sentences.

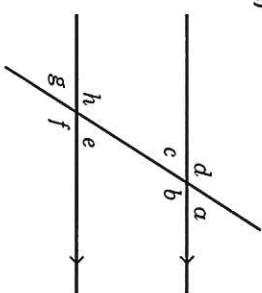
a) Angle a is vertically opposite angle _____

Angle a is corresponding to angle _____

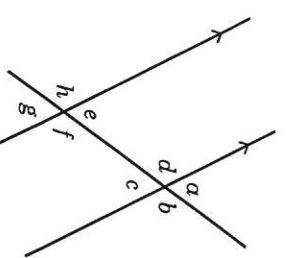
Angle h is alternate to angle _____

Angle h is corresponding to angle _____

Angle h is vertically opposite angle _____



b)

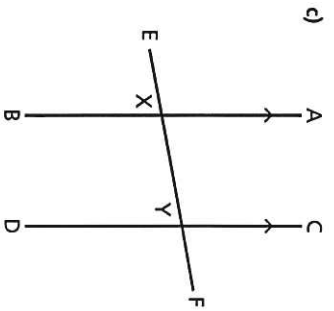


Angles d and _____ are adjacent angles on a straight line.

Angles d and _____ are alternate angles.

Angles _____ and d are corresponding angles.

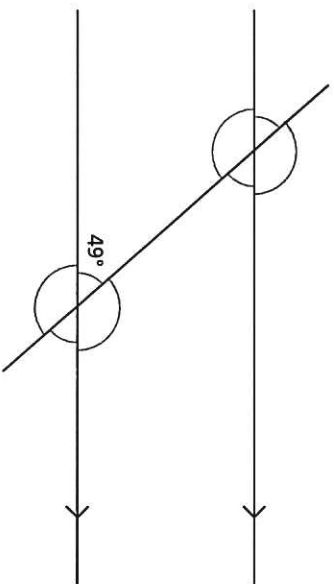
Angles d and _____ are vertically opposite angles.



- c) $\angle AXF$ is alternate to _____
 $\angle AXF$ is corresponding to _____
 $\angle DYF$ is corresponding to _____
 $\angle DYF$ is vertically opposite to _____
 $\angle AXF$ and _____ are adjacent angles on a straight line.

5

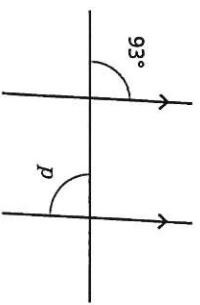
Work out the sizes of the unknown angles and label them on the diagram.



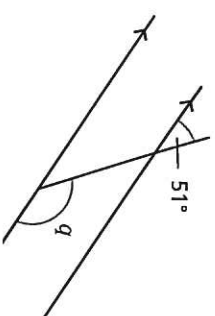
Compare your thinking with a partner.
 Did you work them out the same way?

6

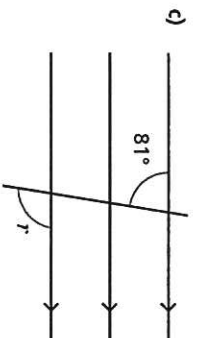
Work out the sizes of the unknown angles.



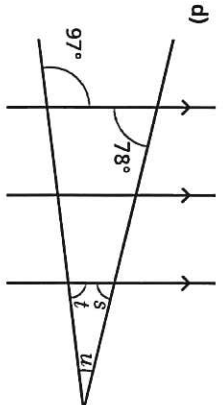
$p =$



$q =$



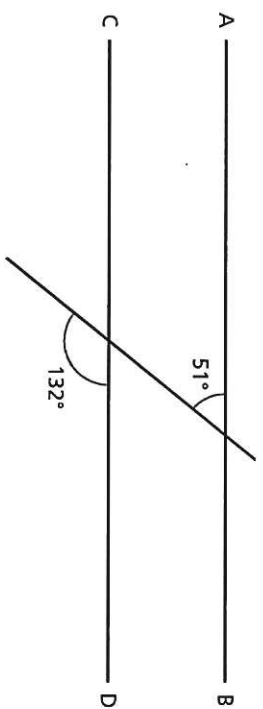
$r =$



$s =$ $u =$
 $t =$

Discuss your reasons with a partner.

7



Are line segments AB and CD parallel? _____
 Explain your answer.

Use known facts to obtain simple proofs

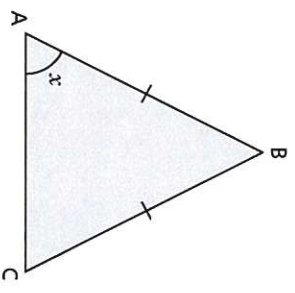
H



1

ABC is an isosceles triangle.

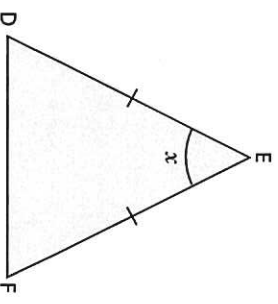
- a) Write an expression for the size of angle ACB. _____
- b) Show that angle $ABC = 180 - 2x$.
Give reasons to support your answer.



2

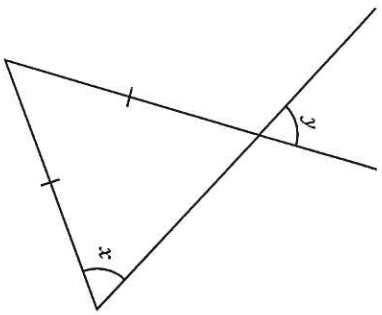
DEF is an isosceles triangle.

- Show that $\angle EDF = \frac{180 - x}{2}$
- Give reasons to support your answer.



3

- Prove that angle x is equal to angle y .
- Give reasons for each step of your workings.



4

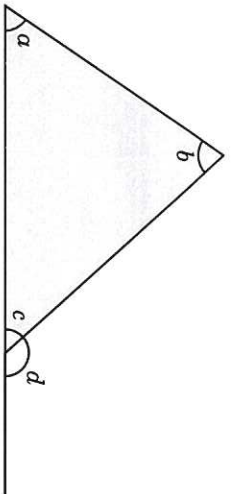
- Line segments AB and CD are parallel.
- EF is a transversal that cuts through the line segments at points X and Y respectively.
- Angle $AXF = t$
- a) Draw a diagram to show this.

- b) Show that angle $FYD = 180 - t$.
- Give reasons to support your answer.



5

A triangle has interior angles a , b and c .



Show that $d = a + b$.

Give reasons to support your answer.



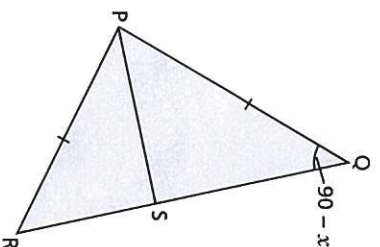
7

QPR is an isosceles triangle.

PS is perpendicular to QR.

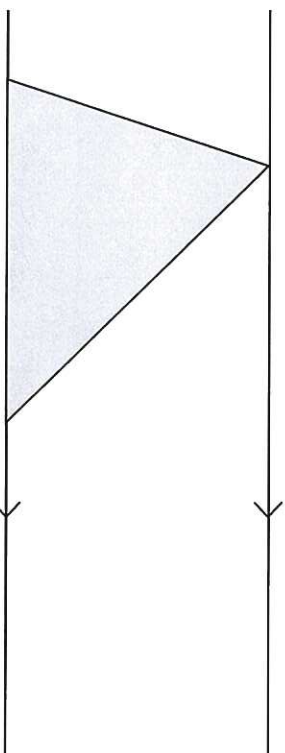
Prove that PS bisects angle QPR.

Give reasons to support each stage of your workings.



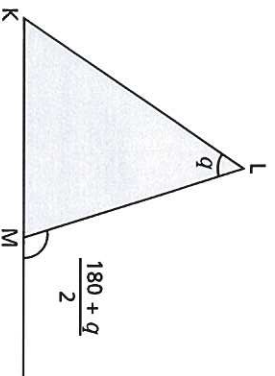
8

Use rules of parallel lines to prove that the sum of the angles in a triangle is 180° .



6

KLM is a triangle.



Prove that triangle KLM is an isosceles triangle.

Give reasons to support each stage of your workings.



Compare your method with a partner's.

