LONGSANDS
SIXTH FORM
Astrea Academy Trust
LEARN, THRIVE, SUCCEED

A Level Maths Transition Work Y11 - Y12

Work through the questions in this booklet and use online resources such as Sparx Maths or Corbett Maths to revise and improve in any topic you struggle with. We have chosen topics from the GCSE course which are essential for success at A Level. You need to be fluent in each topic to be ready to study Mathematics at Key Stage 5. These questions should be done without a calculator.

In the first two weeks of your Y12 maths course you will have a test on the content covered in this booklet, which you must pass.

Good luck!

Mathematics Pre-Course Work

1. Fractions

Examples: Calculate 1) $1\frac{2}{3}+1\frac{1}{2}$ 2) $\frac{3}{8}\times\frac{4}{9}$ and 3) $2\frac{1}{4}\div\frac{3}{5}$

Solution 1) $1\frac{2}{3}+1\frac{1}{2}$

$=\frac{5}{3}+\frac{3}{2}$

$=\frac{10}{6}+\frac{9}{6}$

$=\frac{19}{6}$

$=3\frac{1}{6}$

Solution 2) $\frac{3}{8}\times\frac{4}{9}$

$=\frac{\cancel{3}^{1}}{\cancel{8}^{2}}\times\frac{\cancel{4}^{1}}{\cancel{9}_{3}}$

$=\frac{1}{2}\times\frac{1}{3}$

$=\frac{1}{6}$

Solution 3) $2\frac{1}{4}\div\frac{3}{5}$

$=\frac{9}{4}\div\frac{3}{5}$

$=\frac{\cancel{9}^{3}}{4}\times\frac{5}{\cancel{3}^{1}}$

$=\frac{3}{4}\times\frac{5}{1}$

$=\frac{15}{4}$

Your Turn:

a) $\frac{3}{5}-\frac{1}{5}=$

b) $\frac{3}{7}-\frac{4}{7}=$

c) $\frac{2}{5}+\frac{3}{10}=$

d) $2\frac{1}{5}+\frac{3}{10}=$

e) $\frac{3}{8}-\frac{1}{6}=$

f) $1\frac{9}{10}-\frac{1}{3}=$

g) $\frac{2}{3}\times3\frac{4}{5}=$

h) $2\frac{4}{5}\times4\frac{5}{6}=$

i) $1\div\frac{1}{5}=$

j) $\frac{2}{3}\div1\frac{1}{9}=$

2. Laws of Indices

Examples: Simplify, writing as a single power. 1) $4^2 \times 4^5$ 2) $4^9 \div 4^3$ 3) $(5^2)^5$

Solution 1) $4^2 \times 4^5$

$= 4^{2+5}$

$= 4^7$

Solution 2) $4^9 \div 4^3$

$= 4^{9-3}$

$= 4^6$

Solution 3) $(5^2)^5$

$= 5^{2\times5}$

$= 5^{10}$

Your Turn:

a) $2^2 \times 2^5 =$

b) $3^4 \div 3^3 =$

c) $4^7 \div 4^3 \times 4^2 =$

d) $(x^5)^3 =$

e) $(a^4)^3 \div (a^2)^3 =$

f) $\frac{c^3\times c^2}{c^7} =$

Examples: Calculate the value without a calculator. 1) 5^{-3} 2) $8^{1/3}$

Solution 1) 5^{-3}

$=\frac{1}{5^3}$

$=\frac{1}{125}$

Solution 2) $8^{1/3}$

$=\sqrt[3]{8}$

$= 2$

Your Turn:

g) $3^{-2} =$

h) $7^0 =$

i) $2 \times 3^3 =$

j) $2^2 \times 3^2 =$

k) $64^{\frac{1}{2}} =$

l) $27^{\frac{1}{3}}$

3. Surds

Examples: Simplify, writing as a single surd where possible 1) $\sqrt{3} + 2\sqrt{3}$ 2) $\sqrt{2} \times \sqrt{5}$ 3) $\sqrt{90}$

Solution 1) $\sqrt{3} + 2\sqrt{3}$
$= 3\sqrt{3}$

Solution 2) $\sqrt{2} \times \sqrt{5}$
$= \sqrt{2 \times 5}$
$= \sqrt{10}$

Solution 3) $\sqrt{90}$
$= \sqrt{9 \times 10}$
$= \sqrt{9} \times \sqrt{10}$
$= 3\sqrt{10}$

Your Turn:

a) $3\sqrt{7} + 2\sqrt{7} =$

b) $4\sqrt{2} - 3\sqrt{2} =$

c) $3\sqrt{7} \times \sqrt{7} =$

d) $3\sqrt{6} \times \sqrt{6} =$

e) $\sqrt{18} =$

f) $\sqrt{32} =$

g) $\sqrt{54} =$

h) $\sqrt{12} =$

4. Expanding and Simplifying Expressions

Examples: Expand and simplify 1) 4(x + 2) – 3(x – 1) and 2) (x + 4)(x – 6)

Solution 1) 4(x + 2) – 3(x – 1)
= 4x + 8 – 3x + 1
= 4x – 3x + 8 + 1
= x + 9

Solution 2) (x + 4)(x – 6)
= x^2 – 24 + 4x – 6x
= x^2 – 2x - 24

Your Turn:

a) $6b^2 + 5b - 1 + 3b + 4$

b) 5(x – 3)

c) -2(3x + 1)

d) 3(4x + 2) + 5(2x – 1)

e) 5(2x – 4) – 2(3x – 7)

f) (x – 1)(x + 1)

g) (3a + 2)(a – 1)

h) (2b – 3)(3b – 2)

i) 4(xy)

j) $(3x)^2$

k) $\frac{3x+6y}{3}$

l) $\frac{4}{2x+4}$

m) $\frac{2}{5x-2}$

5. Factorising

Examples: 1) 9xy + 15x 2) $x^2 + 3x + 2$ 3) $x^2 - 9$

Solution 1) 9xy + 15x — write the highest common factor, HCF, outside the brackets
3x( ) — divide both parts of the expression by the HCF
3x(3y + 5) — check your answer by multiplying through the brackets.

Solution 2) $x^2 + 3x + 2$ Set out double brackets, writing an x in each one
$(x\ \ )(x\ \ )$ Think of two factors of 2 that will add to 3.
$(x + 2)(x + 1)$

Solution 3) $x^2 - 9$ 9 and x^2 are both square numbers; this is a DOTS question!
$(x + 3)(x - 3)$ add and subtract the square roots in the brackets.

Your Turn:

a) $4x + 8 =$

b) $2ab + ad$

c) $8x^2 - 10x$

d) $8ab^2 - 4a^2b$

e) $x^2 + 4x + 3$

f) $x^2 + 8x + 15$

g) $x^2 + 12x - 28$

h) $x^2 - 17x + 30$

i) $x^2 - 36$

j) $2x^2 + 7x + 5$

6. Solving Linear Equations

Examples:

Solve the following equations 1) $5x + 4 = 11$ and 2) $7(x - 2) = 7$

Solution 1)

$5x + 4 = 11$

$5x = 11 - 4$

$5x = 7$

$x = 7 \div 5 = \frac{7}{5}$

Solution 2)

$7(x - 2) = 7$

$7x - 14 = 7$

$7x = 7 + 14 = 21$

$x = 21 \div 7 = 3$

Your Turn:

a) $5x + 7 = 32$

b) $2(2x - 7) = 7$

c) $4x - 5 = 2x + 7$

d) $3p + 2 = 5 - p$

e) $2 - 3(2x - 5) = 7 - x$

f) $\frac{3x-13}{7} + \frac{11-4x}{3} = 0$

g) $\frac{6}{x} + \frac{3}{2x} = \frac{5}{2}$

7. Formulae

Examples: Substitute into the following formulae to determine the missing value 1) If $x = ab - c$, find x when $a = 4$, $b = \frac{1}{2}$ and $c = -5$

$x = ab - c$

$= 4 \times \frac{1}{2} - (-5)$ $\quad 4 \times \frac{1}{2} = 2$ and $-(-5)$ is the same as $+5$

$= 2 + 5$

$= 7$

Your Turn:

a) $x = ab + c$ Find x when $a = \frac{2}{3}$, $b = 9$ and $c = -3$

b) $x = 2a^2$ Find x when $a = \frac{3}{4}$

c) $A = 4\pi r^2$ Find r when A = 616

d) $a = b - \frac{1}{2}c$ Find c when a = 6 and b = 10

e) $v = u + at$ Find a when v = 21.5, u = 4 and t = 7

Examples: Make x the subject of each of these formulae;

1) $a = x - ab$ 2) $xy = w$ and 3) $f = d(x + e)$

Solution 1)

$a = x - ab$ Treat ab as a single item; add ab to each side

$a + ab = x$ Swap each side to give $x =$

$x = a + ab$

Solution 2)

$xy = w$ Remember that $xy = x \times y,$ you need to divide by y

$x = \frac{w}{y}$

Solution 3)

$f = d(x + e)$ Firstly multiply out the brackets

$f = dx + de$ Treating de as a single item; subtract de from each side

$f - de = dx$ Divide by d

$\frac{f - de}{d} = x$ Swap each side to give $x =$

$x = \frac{f - de}{d}$

Your Turn:

f) $3x = b$

g) $\frac{x}{5} = d$

h) $f = 4 - x$

i) $2(3x - 1) = 5y$

j) $ax = bx + c$

k) $mx = u - 2x$

l) $\sqrt{x - 2} = y$

8. Solving Quadratic Equations

Examples:

Solve the following quadratic equations; 1) $x^2 - 8x + 12 = 0$ and 2) $y^2 + 13y + 40 = 0$.

Solution 1)

In the quadratic equation $x^2 - 8x + 12 = 0$, the expression can be factorised. So (x – 6)(x – 2) = 0

We set each factor pair equal to zero to get our two solutions.

x – 6 = 0 and x – 2 = 0

x = 6 or 2

Solution 2)

In the equation $y^2+13y+40=0$, we have $a=1$, $b=13$ and $c=40$. So

$$y=\frac{-13\pm\sqrt{13^2-4\times1\times40}}{2\times1}=\frac{-13\pm\sqrt{169-160}}{2}=\frac{-13\pm\sqrt{9}}{2}=\frac{-13\pm3}{2}=\frac{-13+3}{2}\text{ or }\frac{-13-3}{2}=-5\text{ or }-8$$

Your Turn:

a) $n^2 + 5n + 4 = 0$

b) $t^2 - 4t - 12 = 0$

c) $x^2 - 81 = 0$

d) $x^2 - 2x - 6 = 0$

e) $x^2 - 6x - 8 = 0$

f) $3x^2 + 10x - 7 = 0$

9. Simultaneous Linear Equations

Examples:

Solve the following pairs of simultaneous equations

1) $\begin{aligned} 7x+2y&=32\\ x+y&=1\end{aligned}$

2) $\begin{aligned} 5x+2y&=26\\ 4x-3y&=7\end{aligned}$

Solution 1)

Double the second equation to give

$$\begin{aligned} 7x+2y&=32\\ 2x+2y&=2\end{aligned}$$

Subtract the new second equation from the new first, and solve the resulting equation to find x

$$\begin{aligned} 5x&=30\\ x&=6\end{aligned}$$

Substitute into either of the original equations to find y

$$\begin{aligned} x+y&=1\\ \Rightarrow\quad 6+y&=1\\ y&=-5\end{aligned}$$

Solution 2)

Multiply the first equation by 3 and the second equation by 2 to give

$$\begin{aligned} 15x+6y&=78\\ 8x-6y&=14\end{aligned}$$

Add the two equations and solve

$$\begin{aligned} 23x&=92\\ x&=4\end{aligned}$$

Substitute into either of the original equations to find y

$$\begin{aligned} 5x+2y&=26\\ \Rightarrow 20+2y&=26\\ 2y&=6\\ y&=3\end{aligned}$$

Your Turn:

a) 5x – 3y = 23
2x + 3y = 26

b) y = 2x + 1
3y + 10x = 7

c) 5x + 2y = 11
3x + 7y = -5

d) x + 2y = 4
2x + y = 5

e) 3x – 6y = 33
x – 3y = 16

10. Straight Line Graphs

Draw the graph and state the gradient and y-intercept for each line.

Example: y = 3x – 2

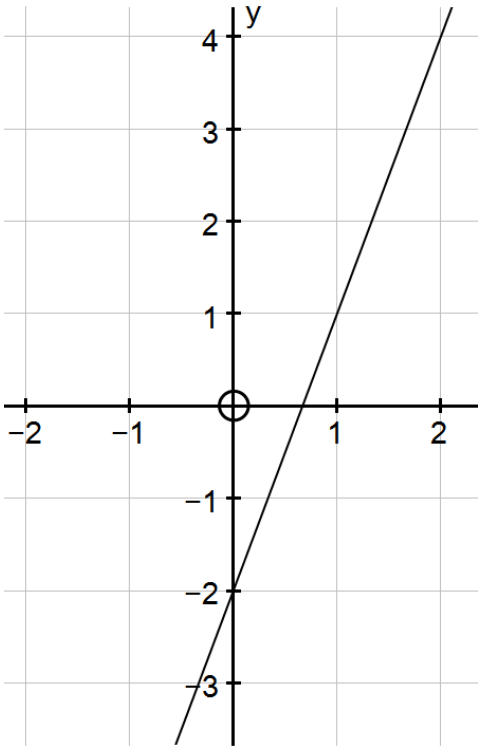
Either set up a table of values to get some coordinates or go straight to the graph using the gradient and y-intercept.

x	-2	0	2
y	-8	-2	4

y = 3 x -2 – 2 = 8

y = 3 x 0 – 2 = -2

y = 3 x 2 – 2 = 4



When written in the form y = mx + c

m = gradient = $\frac{change\ in\ y}{change\ in\ x}$

c = y-intercept

for this equation, m = 3 and c = -2

Your Turn:

a) y = 2x + 1

b) $y = \frac{2}{3}x - 3$

c) x + 2y = 6

Mathematics Pre-Course Work
Solutions

1a) $\frac{3}{5} - \frac{1}{5} = \frac{2}{5}$

b) $\frac{3}{7} - \frac{4}{7} = \frac{-1}{7}$

c) $\frac{2}{5} + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$

d) $2\frac{1}{5} + \frac{3}{10} = \frac{11}{5} + \frac{3}{10} = \frac{22}{10} + \frac{3}{10} = \frac{25}{10} = \frac{5}{2}$

e) $\frac{3}{8} - \frac{1}{6} = \frac{9}{24} - \frac{4}{24} = \frac{5}{24}$

f) $1\frac{9}{10} - \frac{1}{3} = \frac{19}{10} - \frac{1}{3} = \frac{57}{30} - \frac{10}{30} = \frac{47}{30}$

g) $\frac{2}{3} \times 3\frac{4}{5} = \frac{2}{3} \times \frac{19}{5} = \frac{38}{15}$

h) $2\frac{4}{5} \times 4\frac{5}{6} = \frac{14}{5} \times \frac{29}{6} = \frac{\overset{7}{\cancel{14}}}{5} \times \frac{29}{\underset{3}{\cancel{6}}} = \frac{203}{15}$

i) $1 \div \frac{1}{5} = \frac{1}{1} \div \frac{1}{5} = \frac{1}{1} \times \frac{5}{1} = \frac{5}{1} = 5$

j) $\frac{2}{3} \div 1\frac{1}{9} = \frac{2}{3} \div \frac{10}{9} = \frac{2}{3} \times \frac{9}{10} = \frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{3}{\cancel{9}}}{\underset{5}{\cancel{10}}} = \frac{3}{5}$

2a) $2^2 \times 2^5 = 2^{2+5} = 2^7$

b) $3^4 \div 3^3 = 3^{4-3} = 3^1 = 3$

c) $4^7 \div 4^3 \times 4^2 = 4^{7-3+2} = 4^6$

d) $(x^5)^3 = x^{5\times3} = x^{15}$

e) $(a^4)^3 \div (a^2)^3 = a^{4\times3} \div a^{2\times3} = a^{12} \div a^6 = a^{12-6} = a^6$

f) $\frac{c^3 \times c^2}{c^7} = \frac{c^{3+2}}{c^7} = \frac{c^5}{c^7} = c^{5-7} = c^{-2}$

g) $3^{-2} = \frac{1}{3^2} = \frac{1}{9}$

h) $7^0 = 1$

i) $2 \times 3^3 = 2 \times 27 = 54$

j) $2^2 \times 3^2 = 4 \times 9 = 36$

k) $64^{\frac{1}{2}} = \sqrt{64} = 8$

l) $27^{\frac{1}{3}} = \sqrt[3]{27} = 3$

3a) $3\sqrt{7} + 2\sqrt{7} = 5\sqrt{7}$

b) $4\sqrt{2} - 3\sqrt{2} = 1\sqrt{2} = \sqrt{2}$

c) $3\sqrt{7} \times \sqrt{7} = 3 \times 7 = 21$

d) $3\sqrt{6} \times \sqrt{6} = 3 \times 6 = 18$

e) $\sqrt{18} = \sqrt{2 \times 9} = \sqrt{2}\sqrt{9} = \sqrt{2} \times 3 = 3\sqrt{2}$

f) $\sqrt{32} = \sqrt{16 \times 2} = \sqrt{16}\sqrt{2} = 4\sqrt{2}$

g) $\sqrt{54} = \sqrt{9 \times 6} = \sqrt{9}\sqrt{6} = 3\sqrt{6}$

h) $\sqrt{12} = \sqrt{4 \times 3} = \sqrt{4}\sqrt{3} = 2\sqrt{3}$

4a) $6b^2 + 5b - 1 + 3b + 4 = 6b^2 + 5b + 3b - 1 + 4 = 6b^2 + 8b + 3$

b) $5(x - 3) = 5x - 15$

c) $-2(3x + 1) = -6x - 2$

d) $3(4x + 2) + 5(2x - 1) = 12x + 6 + 10x - 5 = 22x + 1$

e) $5(2x - 4) - 2(3x - 7) = 10x - 20 - 6x + 14 = 4x - 6$

f) $(x - 1)(x + 1) = x^2 + x - x - 1 = x^2 - 1$

g) $(3a + 2)(a - 1) = 3a^2 - 3a + 2a - 2 = 3a^2 - a - 2$

h) $(2b - 3)(3b - 2) = 6b^2 - 4b - 9b + 6 = 6b^2 - 13b + 6$

i) $4(xy) = 4xy$

j) $(3x)^2 = (3x)(3x) = 9x^2$

k) $\frac{3x + 6y}{3} = x + 2y$

l) $\frac{4}{2x + 4} = \frac{2 \times 2}{2 \times (x + 2)} = \frac{2}{x + 2}$

m) $\frac{2}{5x - 2}$ cannot be simplified further

5a) $4x + 8 = 4(x+2)$

b) $2ab + ad = a(2b+d)$

c) $8x^2 - 10x = 2x(4x-5)$

d) $8ab^2 - 4a^2b = 4ab(2b-a)$

e) $x^2 + 4x + 3 = (x+3)(x+1)$

f) $x^2 + 8x + 15 = (x+3)(x+5)$

g) $x^2 + 12x - 28 = (x+14)(x-2)$

h) $x^2 - 17x + 30 = (x-15)(x-2)$

i) $x^2 - 36 = (x-6)(x+6)$

j) $2x^2 + 7x + 5 = (2x+5)(x+1)$

Part b: Solving linear equation

a) $5x + 7 = 32$

$-7)\quad 5x = 25$

$\div 5)\quad x = 5$

b) $2(2x-7) = 7$

$4x - 14 = 7$

$+14)\quad 4x = 21$

$\div 4)\quad x = \frac{21}{4}$ or $5\frac{1}{4}$

c) $4x - 5 = 2x + 7$

$+5)\quad 4x = 2x + 12$

$-2x)\quad 2x = 12$

$\div 2)\quad x = 6$

d) $3p + 2 = 5 - p$

$+p)\quad 4p + 2 = 5$

$-2)\quad 4p = 3$

$\div 4)\quad p = 3/4$

e) $2 - 3(2x-5) = 7 - x$

$2 - 6x + 15 = 7 - x$

$17 - 6x = 7 - x$

$+6x)\quad 17 = 7 + 5x$

$-7)\quad 10 = 5x$

$\div 5)\quad 2 = x$

f) $\frac{3x-13}{7} + \frac{11-4x}{3} = 0$

Common denominator

$$\frac{3(3x-13) + 7(11-4x)}{21} = 0$$

$$\therefore 3(3x-13) + 7(11-4x) = 0$$

$$9x - 39 + 77 - 28x = 0$$

rearrange) $77 - 39 = 28x - 9x$

$$38 = 19x$$

$\div 19$) $\quad 2 = x$

g) $\frac{6}{x} + \frac{3}{2x} = \frac{5}{2}$

Common denominator $2x$ on both sides

$$\frac{12}{2x} + \frac{3}{2x} = \frac{5x}{2x}$$

$$\therefore \frac{12+3}{2x} = \frac{5x}{2x}$$

$$\therefore 15 = 5x$$

$\div 5$) $\quad 3 = x$

Part 7 : Formulae

a) $x = ab + c$

$x = \frac{3}{3} \times 9 - 3$

$x = 6 - 3$

$x = 3$

b) $x = 2a^2$

$x = 2 \times \left(\frac{3}{4}\right)^2$

$x = 2 \times \frac{9}{16}$

$x = \frac{9}{8}$

c) $A = 4\pi r^2$

$616 = 4\pi r^2$

$\div 4\pi$) $\frac{616}{4\pi} = r^2$

$\sqrt{}$) $\sqrt{\frac{616}{4\pi}} = r$

$\therefore r = 7$ (1SF)

d) $a = b - \frac{1}{2}c$

$6 = 10 - \frac{1}{2}c$

$\therefore \frac{1}{2}c = 10 - 6$

$\frac{1}{2}c = 4$

$c = 8$

e) $v = u + at$

$21.5 = 4 + a \times 7$

-4) $17.5 = 7a$

$\div 7$) $2.5 = a$

f) $3x = b$

$\div 3$) $\therefore x = \frac{b}{3}$

g) $\frac{x}{5} = d$

$\times 5$) $x = 5d$

h) $f = 4 - x$

$+x$) $x + f = 4$

$-f$) $x = 4 - f$

i) $2(3x - 1) = 5y$

$6x - 2 = 5y$

$+2$) $6x = 2 + 5y$

$\div 6$) $x = \frac{2 + 5y}{6}$

j) $ax = bx + c$

$-bx$) $ax - bx = c$

factd) $x(a - b) = c$

$\div (a + b)$ $x = \frac{c}{a - b}$

k) $mx = u - 2x$

$+2x$) $mx + 2x = u$

factl) $x(m+2) = u$

$\div (m+2)$ $x = \frac{u}{m+2}$

l) $\sqrt{x-2} = y$

sq) $x - 2 = y^2$

+2) $x = y^2 + 2$

Part 8 : Solving quadratic equations

a) $n^2 + 5n + 4 = 0$

$(n+4)(n+1) = 0$

$n = -4$ $n = -1$

b) $t^2 - 4t - 12 = 0$

$(t-6)(t+2) = 0$

$t = 6$ $t = -2$

c) $x^2 - 81 = 0$

$x^2 = 81$

$\sqrt{}$) $x = 9$ or -9

d) $x^2 - 2x - 6 = 0$

This won't factorise

$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \times 1 \times -6}}{2 \times 1}$

$x = \frac{2 \pm \sqrt{4+24}}{2}$

$x = \frac{2 \pm \sqrt{28}}{2}$

$x = 3.65$ or -1.65

to 3 sig figs

e) $x^2 - 6x - 8 = 0$

This won't factorise

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4 \times 1 \times -8}}{2 \times 1}$

$x = \frac{6 \pm \sqrt{36+32}}{2}$

$x = \frac{6 \pm \sqrt{68}}{2} = 7.12$ or -1.12 to 3 sig figs

f) $3x^2 + 10x - 7 = 0$

This won't factorise

$$\therefore x = \frac{-10 \pm \sqrt{10^2 - 4 \times 3 \times -7}}{2 \times 3}$$

$$x = \frac{-10 \pm \sqrt{100 + 84}}{6}$$

$$x = \frac{-10 \pm \sqrt{184}}{6} = 0.594 \text{ or } -3.93$$

to 3 sig figs

Pack 9: Simultaneous equations

a) $5x - 3y = 23$ ①

$2x + 3y = 26$ ②

① + ② $7x = 49$

$\div 7$) $x = 7$

Sub into ② $\therefore 2 \times 7 + 3y = 26$

$14 + 3y = 26$

-14) $3y = 12$

$\div 3$) $y = 4$

b) $y = 2x + 1$ ①

$3y + 10x = 7$ ②

Sub ① into ②

$\therefore 3(2x + 1) + 10x = 7$

$6x + 3 + 10x = 7$

$16x + 3 = 7$

$-3)\quad 16x = 4$

$\div 16)\quad x = \frac{4}{16} = \frac{1}{4}$

Sub into ① $\therefore y = 2 \times \frac{1}{4} + 1$

$y = \frac{1}{2} + 1$

$y = 3\frac{1}{2}$

c) $5x + 2y = 11$ ①

$3x + 7y = -5$ ②

① $\times 3$ gives $15x + 6y = 33$

② $\times 5$ gives $15x + 35y = -25$

Subtract) $-29y = 58$

$\div -29)\quad y = -2$

Sub into ①

$\therefore 5x + 2 \times -2 = 11$

$5x - 4 = 11$

$+4)\quad 5x = 15$

$\div 5)\quad x = 3$

d) $x + 2y = 4$ ①

$2x + y = 5$ ②

① × 2 given $2x + 4y = 8$

Subtract original equation ② $2x + y = 5$

$3y = 3$

$\therefore y = 1$

Sub into ① $x + 2 \times 1 = 4$

$x + 2 = 4$

$-2)$ $x = 2$

e) $3x - 6y = 33$ ①

$x - 3y = 16$ ②

② × 3 give $3x - 9y = 48$

Subtract this from original equation ①

$\therefore$ $3x - 6y = 33$

$3x - 9y = 48$

Subtract) $3y = -15$

$\div 3)$ $y = -5$

Sub into ② $x - 3x - 5 = 16$

$x + 15 = 16$

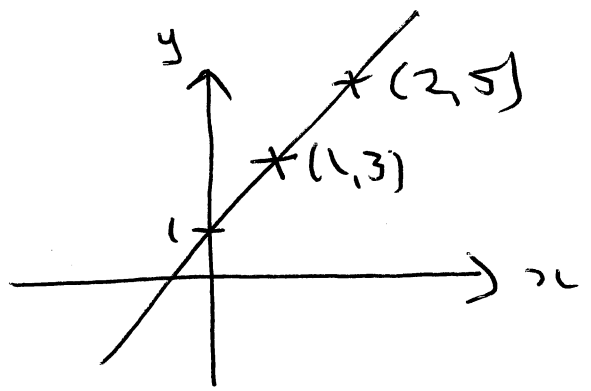
$-15)$ $x = 1$

Part 10: Straight line graphs

a) $y = 2x + 1$

gradient $= 2$

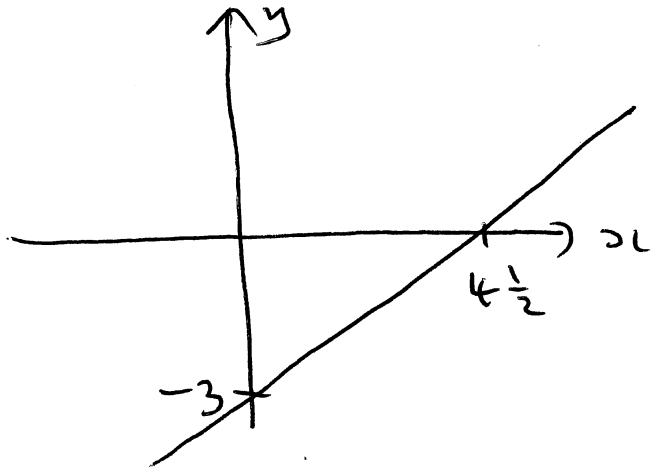
y-intercept $= 1$



b) $y = \frac{2}{3}x - 3$

gradient $= \frac{2}{3}$

y-intercept $= -3$



c) $x + 2y = 6$

$2y = -x + 6$

$\div 2$) $y = -\frac{1}{2}x + 3$

gradient $= -\frac{1}{2}$

y-intercept $= 3$