Securing Grade 4/5 Algebra Revision Question Booklet

Remember the only real failure in life is the failure to try!

Success doesn't come to you, YOU GO TO IT!

Name:

Algebra					
Topic	**Hegartymaths clip number**	**Watched Hegarty video**	**Watched GCSEpod**	**Attempted questions**	**Checked my answers**
Simplifying Expressions (including collecting like terms)	156-159				
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Example Questions
Collecting like terms

Simplify:

(a) $a + a + a + a$

(b) $2b + c + 3b + 2c$

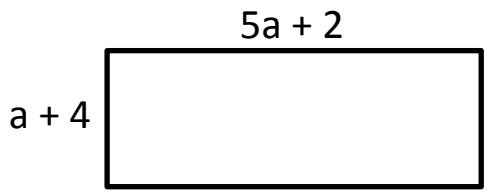
(c) $4a - b + 2b - 2a$

(d) $w^2 + w^2$

(e) $4x^2 - x^2$

(f) $5x^2 + x - x^2 + 9x$

(g) Write an expression for the perimeter of the rectangle.



A) Simplify:

1) $b + b + b + b + b$

2) $3a + 7a + 2a + a$

3) $f + 2f + f + 9f$

4) $7a + b + 2b + a$

5) $4a + c + 2b + 3b + 5c$

6) $8e + f + 5f + 2e$

7) $10a - c + 2a - 3c$

8) $3c + b - 3c + 4b$

9) $8j - k + 3j - 5k - k$

10) $6t + s - 2s + t - 3s + s$

11) $7y + x + 5y - 7y - 2x$

12) $8h + g - 5g + 9g - h$

13) $9j - i + 2i - 8j - 4i$

14) $9y + 2x - 11y - 2y + 9x$

15) $2x^2 + 6x^2$

16) $9y^3 + y^3$

17) $8y^2 - 3y^2$

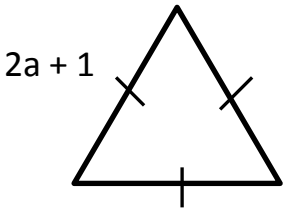
18) $13a^4 - 2a^4$

19) $2a^2 + 3a - a^2 + 5a$

20) $8y - 2y^3 + y^2 - y^3 + 4y^2$

B) Write an expression for the perimeter of each shape.

1)



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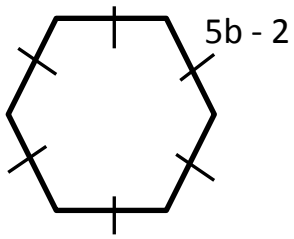

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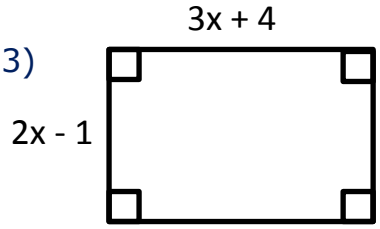

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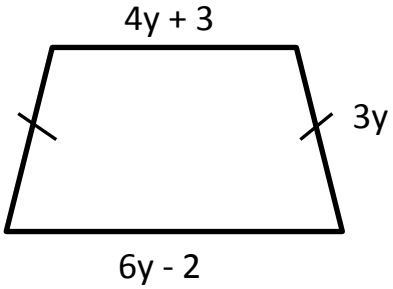
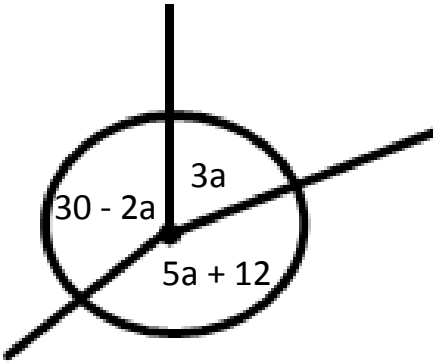
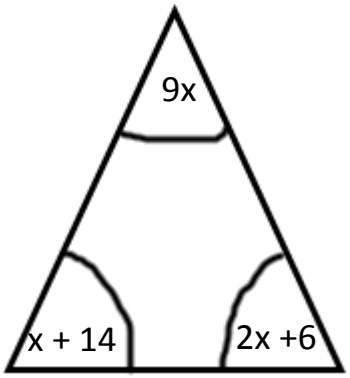


C) Write an expression for the sum of the angles below.

1)



2)



Example Questions
Multiplying and dividing terms

Simplify:

(a) 4 x c

(b) e x e

(c) 5 x a x b x a x a

(d) 4 x a x b x 2 x b

(e) 7e x 5f

(f) 6m x 2m

(g) 15a ÷ 3

(h) 16ab ÷ 8bc

Simplify:

1) 7 x u

2) 6 x a x b

3) 8 x e x f

4) a x a

5) c x c x c x c

6) a x 3 x c

7) 2 x a x 3

8) 5a x 2

9) 8 x 6y

10) 3a x 4b

11) 2e x 6f

12) 9p x 4s

13) 3ab x 6c

14) 11a x 2ab

15) 7bc x 2abc

16) 20a ÷ 4

17) 32c ÷ 8ab

18) 30ef ÷ 6fg

19) 15ef ÷ 45e

20) 12ab ÷ 15bc

21) 18abc ÷ 6abcd

Example Questions
Algebraic Indices

Simplify:

(a) $a^3 \times a^4$

(b) $3a^2 \times 5a^4$

(c) $2a^3b \times 7a^2b^2$

(d) $18a^5 \div 3a^2$

(e) $20a^5b^2 \div 4a^2b$

(f) $\frac{a^3 \times a^7}{a^6}$

(g) $\frac{4a^2 \times 3a^3}{6a^4}$

(h) $(a^3)^5$

(i) $(5a^5)^2$

(j) $(2m^8n)^4$

Simplify:

1) $k^8 \times k^3$

2) $j^{11} \times j^8$

3) $e^7 \times e^{13}$

4) $m^{17} \times m^{12}$

5) $s^4 \times s^3$

6) $h^{12} \times h^3 \times h^4$

7) $c^9 \times c^8 \times c^{-3}$

8) $a^{-7} \times a^4 \times a^{-5}$

9) $4a^7 \times 6a^4$

10) $5h^{12} \times 4h^7$

11) $7w^6 \times 3w^4$

12) $3y^5 \times 3y^3$

13) $5f^4 \times 7f^6$

14) $4n^3 \times 3n^6$

15) $12v^3 \times 6v^{41}$

16) $7g^4 \times 9g^7$

17) $4r^3 \times 5s^{15}$

18) $6r^5 \times r^7 \times 3r^8$

19) $5k^6 \times 7k^{11} \times 2k^3$

20) $3s^5 \times 6s^7 \times t^3$

21) $4y^8 \times 6x^{11} \times 2x^2 \times y^8$

22) $2j^3 \times 3k^5 \times 5k^3 \times 2j^7$

23) $b^{11} \div b^2$

24) $f^{21} \div f^{11}$

25) $d^4 \div d$

26) $a^{13} \div a^{12}$

27) $t^6 \div t^8$

28) $\frac{e^9}{e^2}$

29) $\frac{w^{11}}{w^7}$

30) $\frac{j^{18}}{j^{13}}$

31) $\frac{e^9 \times e^8}{e^{12}}$

32) $\frac{a^{12} \times a^7}{a^2}$

33) $\frac{y^{17} \times y^5}{y^2 \times y^2}$

34) $\frac{h^{35} \times h^8}{h^9 \times h^{11}}$

35) $15f^{15} \div 5f^6$

36) $18n^{18} \div 3n^6$

37) $24v^{21} \div 6v^{13}$

38) $30g^4 \div 5g^7$

39) $32r^{16} \div 8s^{15}$

40) $24x^5y^4 \div 6xy^2$

41) $\frac{35a^{28}}{7a^3}$

42) $\frac{16k^{11}}{8k^7}$

43) $\frac{18a^6b^{11}}{6a^3b}$

44) $(e^3)^5$ 45) $(c^4)^3$ 46) $(y^7)^4$

47) $(j^4)^9$ 48) $(a^4)^8$ 49) $(t^4)^2$

50) $(x^3y^4)^3$ 51) $(2j^7)^5$ 52) $(5y^9)^3$

53) $(3k^8)^4$ 54) $(4y^{11})^3$ 55) $(10a^3b^4)^5$

56) $(5e^4f^9)^2$ 57) $(3a^7b^5)^3$ 58) $(4h^7i^3)^2$

Example Questions
Expanding brackets

A) Expand:

1) $8(2a + 1)$ 2) $3(4e - 1)$

3) $4a(a - 2)$ 4) $3x(2x + y)$

B) Expand and simplify:

1) $3(4a + 2) + 5(a - 1)$ 2) $9(8e + 2) - 2(3e - 5)$

3) $(c + 4)(c + 8)$ 4) $(d + 3)(d - 5)$

5) $(w - 2)(w + 2)$

6) $(k - 3)(k - 6)$

7) $(2w - 1)(w + 4)$

8) $(3a + 2b)^2$

A) Expand:

1) $5(p + 3)$

2) $7(y - 2)$

3) $2(h - 9)$

4) $6(2e - 1)$

5) $9(4p + 3)$

6) $2(5j - 2)$

7) $e(e + 2)$

8) $p(p - 3)$

9) $k(k + 8)$

10) $2y(y - 1)$

11) $3b(b + 5)$

12) $7m(2m + 9)$

13) $3a(10 - 3a)$

14) $-4(2v - 1)$

15) $-5(19 - 4a)$

16) $4ab(2a + b)$

17) $3ef(3e + 2f)$

18) $9ab(2b - 5a)$

19) $2a(3a + b - 5)$

20) $3e^2f(7e - f + 3)$

B) Expand and simplify:

1) $4(a + 3) + 2(a + 1)$

2) $5(p + 5) + 2(p + 3)$

3) $2(3a + 2b) + 6(2a + b)$

4) $4(9i + 2) – 3(2i + 5)$

5) $5(4 – 3y) + 8(2y – 1)$

6) $6(5t + 1) – 3(2t – 1)$

7) $3(4c + 7) – 4(12 – 3c)$

8) $8(3w – 1) – 3(5 – 4w)$

9) $2a(3a + b) – 2(a – 2b)$

10) $6y(5y – 2) -5(9 – 2y)$

11) $(h + 3)(h + 2)$

12) $(e + 9)(e + 2)$

13) $(7 + a)^2$

14) $2(f + 5)^2$

15) $(x + 3)(x – 6)$

16) $(9 + e)(e – 2)$

17) $(w - 5)(w + 5)$

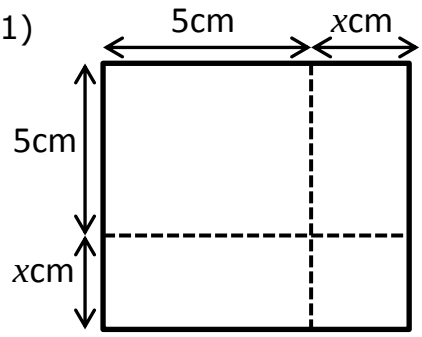
18) $(y - 9)(y - 3)$

19) $(3a - 2)(a + 3)$

20) $(2b - 7)^2$

C) Write an expression for the area of each of the shapes below:

1)



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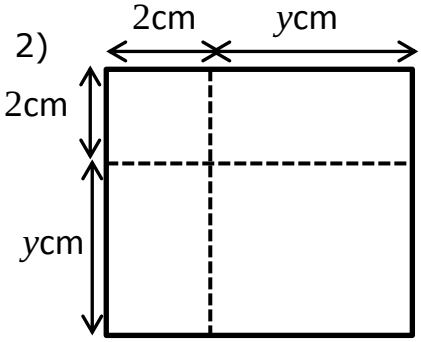

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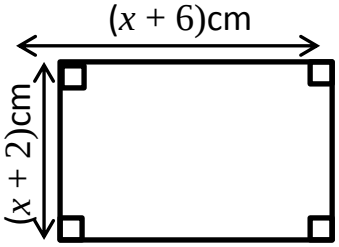

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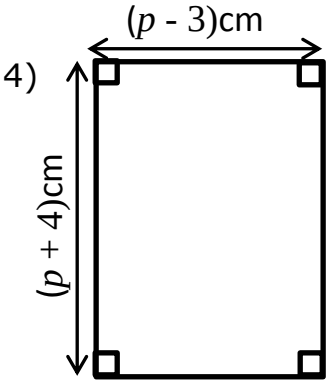

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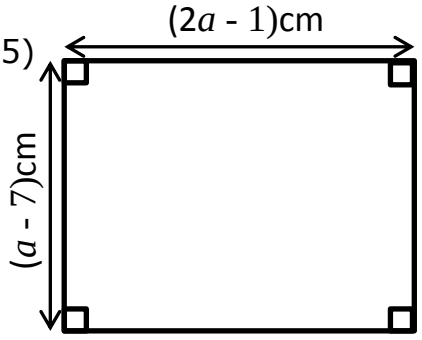


Example Questions
Factorising Expressions

Simplify:

(a) $4a + 8$

(b) $ab + b$

(c) $12ef - 8f$

(d) $x^2 + 5x$

(e) $9a^2b - 12ab^3$

(f) $7(w + 1)^2 + 2(w + 1)$

(g) $x^2 + 10x + 16$

(h) $x^2 - 9x + 14$

(i) $x^2 - 9$

(j) $x^2 + x - 12$

Factorise the following expressions:

1) $6y + 12$

2) $5k + 15$

3) $20 + 10m$

4) $2f - 4$

5) $9i - 45$

6) $25 - 5k$

7) $ef + fg$

8) $cd - d$

9) $7abc + 5bc$

10) $a^2 + 9a$

11) $4y^2 - y$

12) $p^2 - 3p$

13) $2ab + 6bc$

14) $8ef - 20f$

15) $16xy + 40wy$

16) $15a + 10ab$

17) $24ef - 16e$

18) $18a^2 - 24ab^2$

19) $20b^2 + 35bc$

20) $9a^2b + 12ac$

21) $48k^2 - 16kj^2$

22) $8(p + 5)^2 - 3(p + 5)$

23) $5(f - 2)^2 + 2(f - 2)$

24) $7(y - 3) - 2(y - 3)^2$

25) $6(5 - k)^2 + 4(5 - k)$

26) $x^2 + 8x + 12$

27) $x^2 + 11x + 18$

28) $x^2 + 7x + 10$

29) $x^2 - 12x + 20$

30) $x^2 - 10x + 25$

31) $x^2 - 9x + 14$

32) $x^2 - 49$

33) $x^2 - 100$

34) $x^2 - 144$

35) $x^2 - 2x - 35$

36) $x^2 + 5x - 14$

37) $x^2 - x - 20$

Example Questions
Solving Linear Equations

Solve:

(a) $8e + 19 = 59$

(b) $9y - 11 = 16$

(c) $7k - 9 = 11$

(d) $8k + 14 = 6$

(e) $10 - 2e = 22$

(f) $5(2a - 3) = 15$

(g) $7p + 19 = 3p + 43$

(h) $20 - 3x = 2x - 25$

(i) $3(4a - 1) = 5(a + 5)$

(j) $\frac{3y}{2} = 15$

(k) $\frac{3x-4}{5} = 4$

(l) $\frac{5a}{3} + 2 = 9$

Solve:

1) $3e - 8 = 10$

2) $6k + 13 = 37$

3) $7a + 19 = 40$

4) $18 - 3y = 6$

5) $29 = 15 - 2w$

6) $36 = 2(3 - 5k)$

7) $6i - 10 = 23$

8) $2(4w - 1) = 9$

9) $27 = 3(3 - 2x)$

10) $6r + 9 = 8r - 19$

11) $10w + 11 = 3w - 4$

12) $3(4f - 5) = 2f + 25$

13) $5x - 6 = 3(x - 1)$

14) $\frac{2-y}{5} = 1$

15) Solve $\frac{5-x}{2} = 2x - 7$

16) Solve $\frac{4(8x-2)}{3x} = 10$

Example Questions
Forming and solving equations

1) Ali is y years old.
Bhavara is twice as old as Ali.
Ceris is 3 years younger than Ali.
The total of their ages is 125 years.
Work out the age of each person.

Ali.....years

Bhavara.....years

Ceris.....years

2) The diagram shows a garden in the shape of a rectangle.

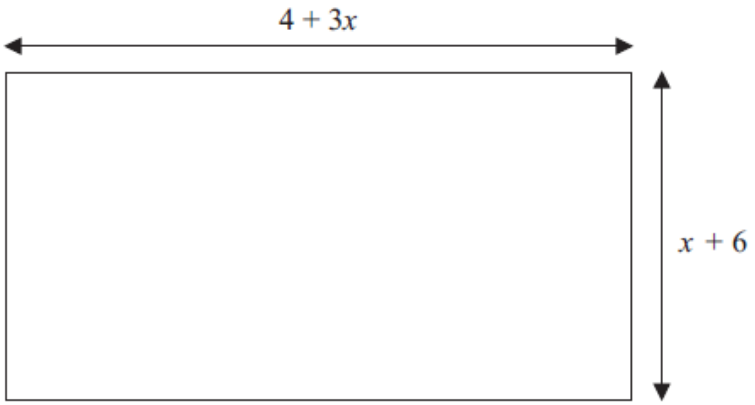


Diagram **NOT** accurately drawn

All measurements are in metres.
The perimeter of the garden is 32 metres.
Work out the value of x

1) Kiaria is 7 years older than Jay.
Martha is twice as old as Kiaria.
The sum of their three ages is 77
Find the ratio of Jay's age to Kiaria's age to Martha's age.

2) The diagram shows a trapezium.

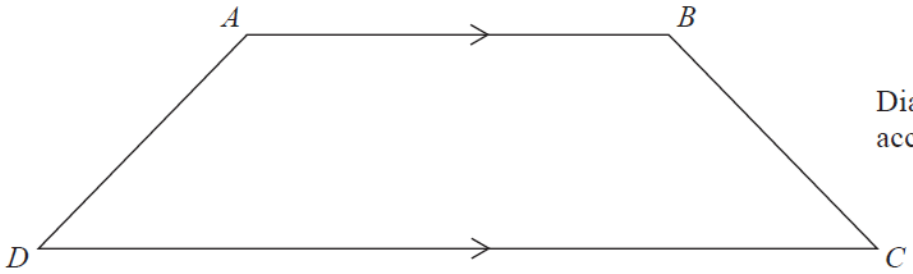


Diagram **NOT** accurately drawn

$AD = x$ cm.
BC is the same length as AD.
AB is twice the length of AD.
DC is 4 cm longer than AB.

The perimeter of the trapezium is 38 cm.

Work out the length of AD.

3)

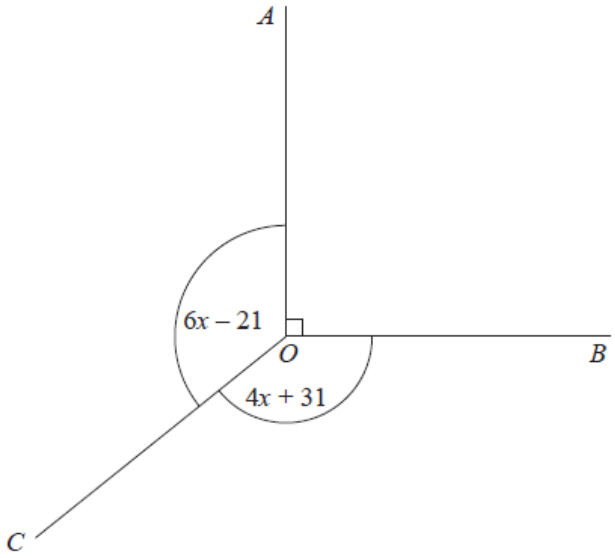


Diagram **NOT** accurately drawn

In the diagram, all angles are in degrees.
Angle *AOB* is a right angle.
Angle *AOC* = Angle *BOC*.
Work out the value of *x*.

4) *ABC* is a triangle.

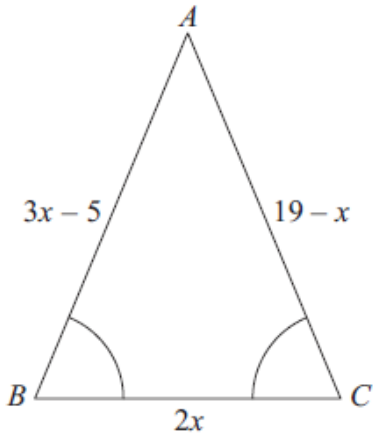


Diagram **NOT** accurately drawn

Angle *ABC* = angle *BCA*.
The length of side *AB* is (3*x* – 5) cm.
The length of side *AC* is (19 – *x*) cm.
The length of side *BC* is 2*x* cm.
Work out the perimeter of the triangle.
Give your answer as a number of centimetres.

5) The diagram shows a triangle.

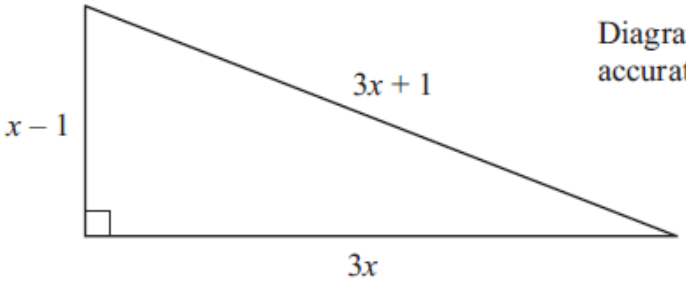


Diagram **NOT** accurately drawn

In the diagram, all the measurements are in metres.
The perimeter of the triangle is 56 m.
The area of the triangle is A m_2.
Work out the value of A.

6) *ABCD* is a trapezium.
STUV is a rectangle.

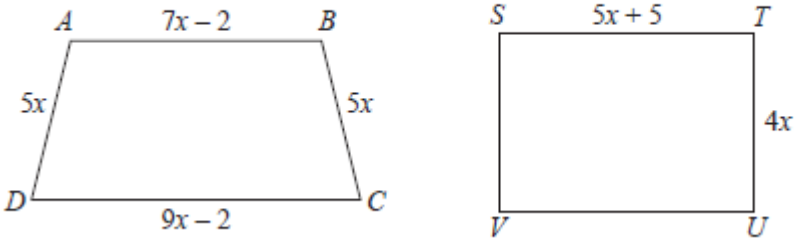
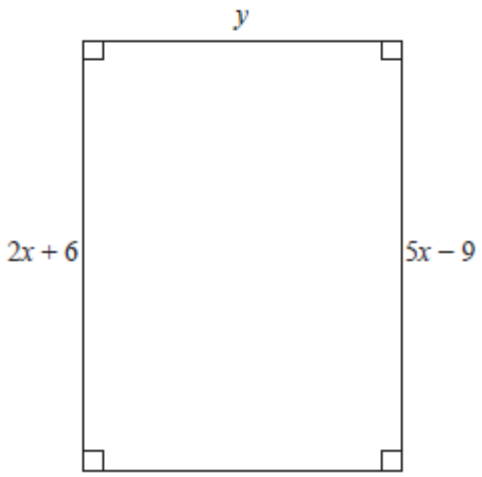


Diagram **NOT** accurately drawn

All measurements are in centimetres.
The two shapes have the same perimeter.
Work out the length of *ST*.

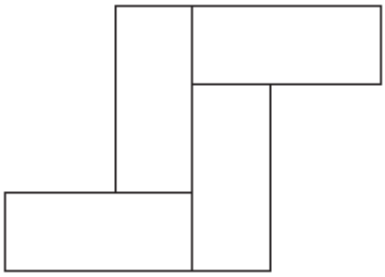
7) Here is a rectangle.



All measurements are in centimetres.
The area of the rectangle is 48 cm^2.
Show that $y = 3$

8) Here is a rectangle.

The length of the rectangle is 7 cm longer than the width of the rectangle.
4 of these rectangles are used to make this 8-sided shape.



The perimeter of the 8-sided shape is 70 cm.
Work out the area of the 8-sided shape.

Example Questions
Rearranging formulae

1) $w = 4p - 16$
Make p the subject of this formula.

2) Make p the subject of the formula

$y = 3p^2 - 4$

3)

$$m = \sqrt{\frac{k+1}{4}}$$

Make k the subject of the formula.

4) Make s the subject of $v^2 = u^2 + 2as$

A) Make ***a*** the subject of the formula.

1) $b = a + 3$

2) $k = 5 + a$

3) $a - 6 = t$

4) $f = a + 2e$

5) $j = 4y + a$

6) $r = a - 9b$

7) $a - 5h = 3b$

8) $a + 3ef = 2$

9) $3w = a - 8p$

10) $5 + f = a - 4e$

11) $\frac{a}{3} = b$

12) $\frac{a}{y} = 4$

13) $\frac{a}{5b} = 2$

14) $3e = \frac{a}{11}$

15) $2c = \frac{a}{3b}$

16) $y = a^2$

17) $a^2 = e + 5$

18) $a^2 + 5 = b$

19) $a^2 - b = 2c$

20) $\sqrt{a} = y$

21) $h = \sqrt{a}$

22) $e = \sqrt{a}$

23) $\sqrt{a} = I$

24) $\sqrt{a} = k$

B) Make ***w*** the subject of the formula.

1) $y = 2w + 5$

2) $e + f = 3w + g$

3) $k - i = 9 + 4w$

4) $7w + 4 = 5e$

5) $8w - 7 = e + f$

6) $e = 5w + 11$

7) $6y + 3 = 5w$

8) $3k = 3w + 9$

9) $7 + 8u = 3w + y$

10) $9bw - y = 2e + f$

11) $10 - 2w = 3a$

12) $7b = 9 - 3w$

13) $5e + f = a - 6w$

14) $4u - 3w = 2a - b$

15) $10 - 2aw = 5b$

16) $a + 2ew = 8b + 3$

17) $\frac{2w}{5} = y$

18) $\frac{5w}{2} = a$

19) $\frac{9w}{b} = a$

20) $3e = \frac{3w}{7}$

21) $5a = \frac{8w}{b}$

22) $\frac{6w}{ab} = 5$

23) $\frac{3}{6w} = y$

24) $5a = \frac{8w}{b}$

25) $3 = \frac{6a}{5aw}$

C) Make ***e*** the subject of the formula.

1) $e^2 = 3a + b$

2) $a = e^2 + 5b$

3) $3 = a + e^2$

4) $v = e^2 - 9$

5) $7 + e^2 = 2k$

6) $2a - e^2 = 9$

7) $2b = 3a - e^2$

8) $6 - e^2 = 7a$

9) $3aw + 5e^2 = 8$

10) $10 - 3e^2 = 7a$

11) $9e^2 + b = 10$

12) $k - 3e^2 = a + b$

13) $\sqrt{e} = 4a + 5$

14) $5 + \sqrt{e} = 2p$

15) $8u + \sqrt{e} = 9a + 10u$

16) $\sqrt{e+5} = 4a$

17) $2a + b = \sqrt{7e}$

18) $\sqrt{5e} = 9a + 2$

19) $\sqrt{9e} = 7f + 1$

20) $8i - 3 = \sqrt{3e}$

21) $4j + 8 = \sqrt{3e-1}$

22) $\frac{\sqrt{e}}{3} = a$

23) $\frac{\sqrt{4e}}{5} = 9w$

24) $\frac{\sqrt{2e+3}}{b} = 4$

25) Make t the subject of the formula $2(t - 5) = y$

26) Make q the subject of the formula $P = 2q + 10$

27) When you are h feet above sea level, you can see d miles to the horizon, where $d = \sqrt{\frac{3h}{2}}$

Make h the subject of the formula.

28) Rearrange $a(q - c) = d$ to make q the subject.

Example Questions
Sequences

1) Find the next three terms of the following Fibonacci-style sequence.

2, 2, 4, 6, 10 ..

2) Here are the first 5 terms of an arithmetic sequence.

6, 11, 16, 21, 26

Find an expression, in terms of n, for the nth term of the sequence.

3) The first four terms of an arithmetic sequence are

21 17 13 9

Find, in terms of n, an expression for the nth term of this sequence.

The nth term of a sequence is $2n^2$

(i) Find the 4th term of the sequence.

(ii) Is the number 400 a term of the sequence?
Give reasons for your answer.

A) Find the next three terms of the following Fibonacci-style sequences

1) 1, 1, 2, 3, . . .

2) 3, 6, 9, 15, . . .

3) 4, 8, 12, 20, . . .

4) 15, 23, 38, 62, . . .

5) 5, 12, 17, 29, . . .

6) −3, 5, 2, 7, . . .

B) Find the nth term of the sequences below:

1) 6, 9, 12, 15

2) 5, 7, 9, 11

3) 4, 10, 16, 22

4) 10, 11, 12, 13

5) 2, 6, 10, 14

6) 1, 4, 7, 10

7) 10, 13, 16, 19

8) 2, 8, 14, 20

9) 9, 11, 13, 15

10) 5, 8, 11, 14

11) 9, 14, 19, 24

12) 3, 9, 15, 21

13) -3, 0, 3, 6

14) -6, 1, 8, 15

15) -9, -1, 7, 15

16) 10, 8, 6, 4

17) 7, 6, 5, 4

18) 15, 12, 9, 6

19) 19, 14, 9, 4

20) 14, 10, 6, 2

21) 20, 17, 14, 11

22) 18, 16, 14, 12

23) 21, 20, 19, 18

24) 38, 33, 28, 23

25) 16, 10, 4, -2

26) 17, 15, 13, 11

27) 28, 20, 12, 4

28) -3, -6, -9, -12

29) 2, -1, -4, -7

30) 10, 0, -10, -20

31) The nth term of a sequence is $3n + 4$
Explain why 21 is not a term of this sequence.

32) Here are the first four terms of an arithmetic sequence.

5 11 17 23

Write down an expression, in terms of n, for the nth term of the sequence.

33) Here are the first four terms of an arithmetic sequence.

11 17 23 29

(a) Find, in terms of n, an expression for the nth term of this arithmetic sequence.

(b) Is 121 a term of this arithmetic sequence?
You must explain your answer.

34) Here are the first six terms of an arithmetic sequence.

3 8 13 18 23 28

(a) Find an expression, in terms of n, for the nth term of this sequence.

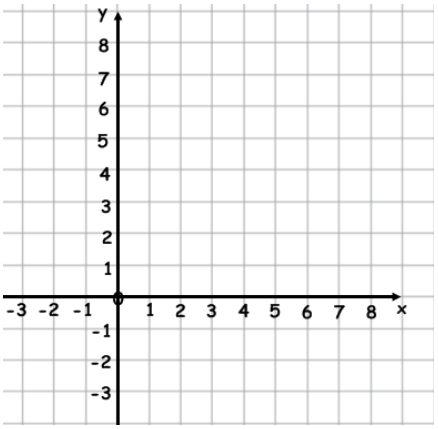
(b) The nth term of a different sequence is $3n^2$
Nathan says that the 4th term of this sequence is 144
Is Nathan right?
Show how you get your answer.

Example Questions
Linear Graphs

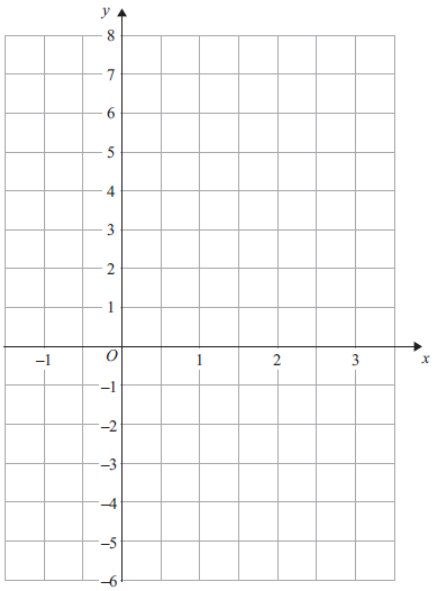
1) Plot the following lines on the graph.

a) y = 4

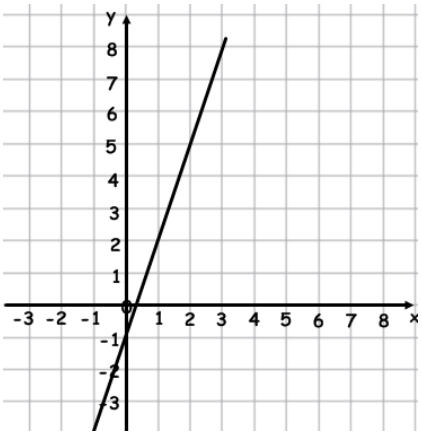
b) x = -2



2) On the grid, draw the graph of $y = 3x - 2$ for values of x from –1 to 3

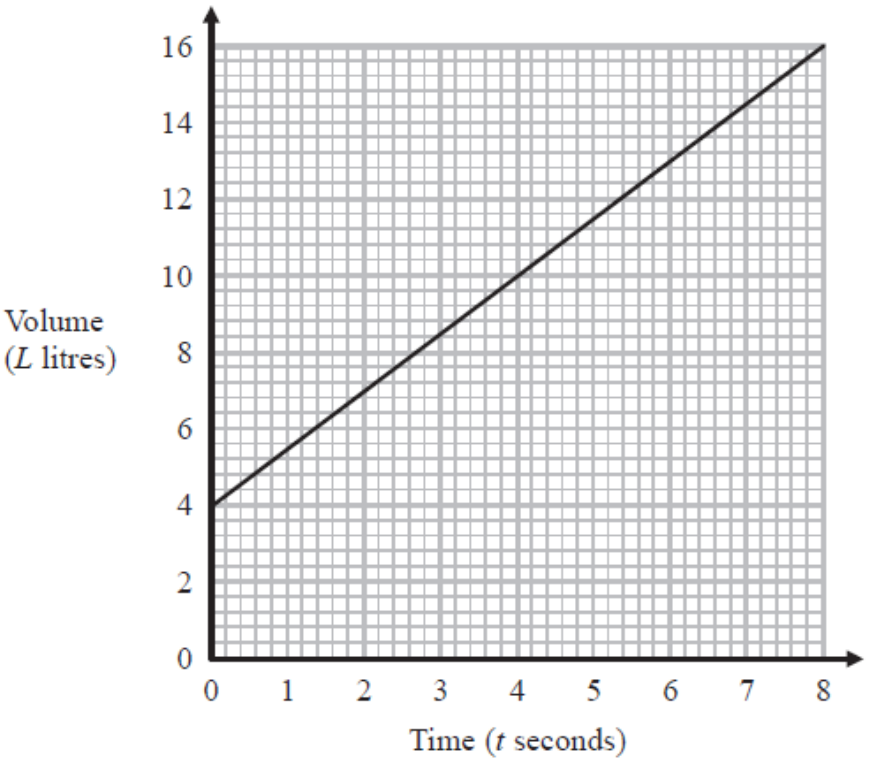


3) The line **J** is shown on the grid.



Find an equation for **J**.

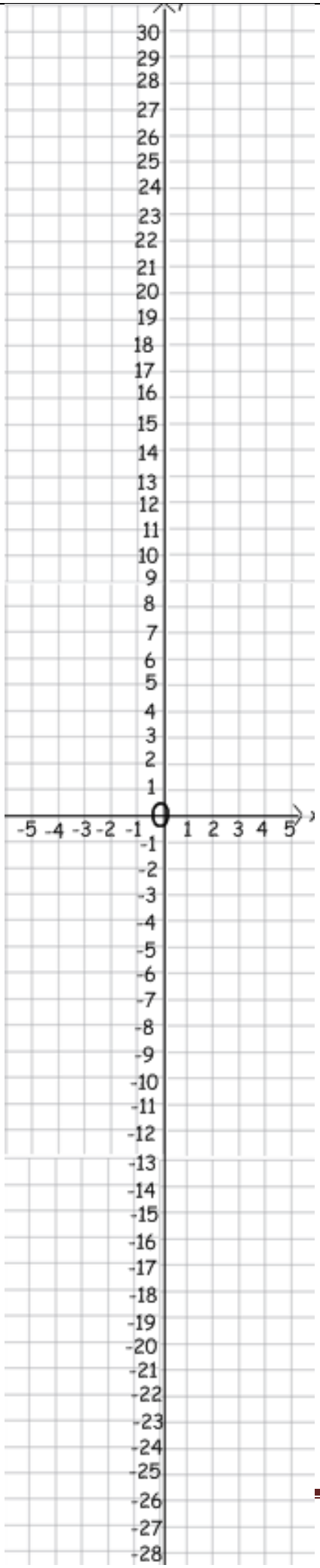
The graph shows the volume of liquid (L litres) in a container at time t seconds.



(a) Find the gradient of the graph.

(b) Explain what this gradient represents.

The graph intersects the volume axis at $L = 4$
(c) Explain what this intercept represents.



Complete the table of values and plot the graphs for each equation

1) y = x

X	-3	-2	-1	0	1	2	3
y							

2) y = 2x

X	-3	-2	-1	0	1	2	3
y							

3) y = 2x + 5

X	-3	-2	-1	0	1	2	3
y							

4) y = 3x + 11

X	-3	-2	-1	0	1	2	3
y							

5) y = 5x - 1

X	-3	-2	-1	0	1	2	3
y							

6) y = 4x - 3

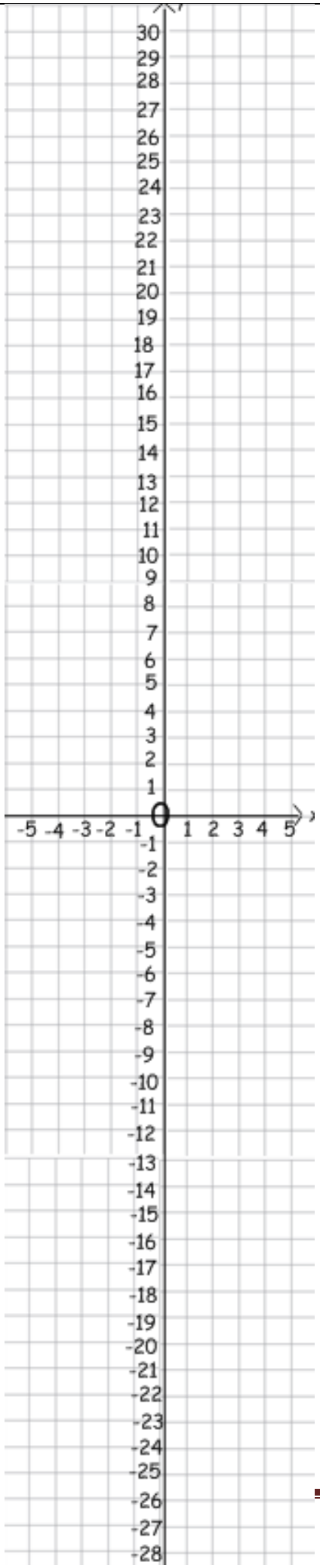
X	-3	-2	-1	0	1	2	3
y							

7) y = 7x - 6

X	-3	-2	-1	0	1	2	3
y							

8) y = 7x - 8

X	-3	-2	-1	0	1	2	3
y							



Complete the table of values and plot the graphs for each equation

9) y = 8x

X	-3	-2	-1	0	1	2	3
y							

10) y = 9x - 11

X	-3	-2	-1	0	1	2	3
y							

11) y = 4x + 13

X	-3	-2	-1	0	1	2	3
y							

12) y = 6x + 9

X	-3	-2	-1	0	1	2	3
y							

13) y = 7x + 13

X	-3	-2	-1	0	1	2	3
y							

14) y = 5x - 12

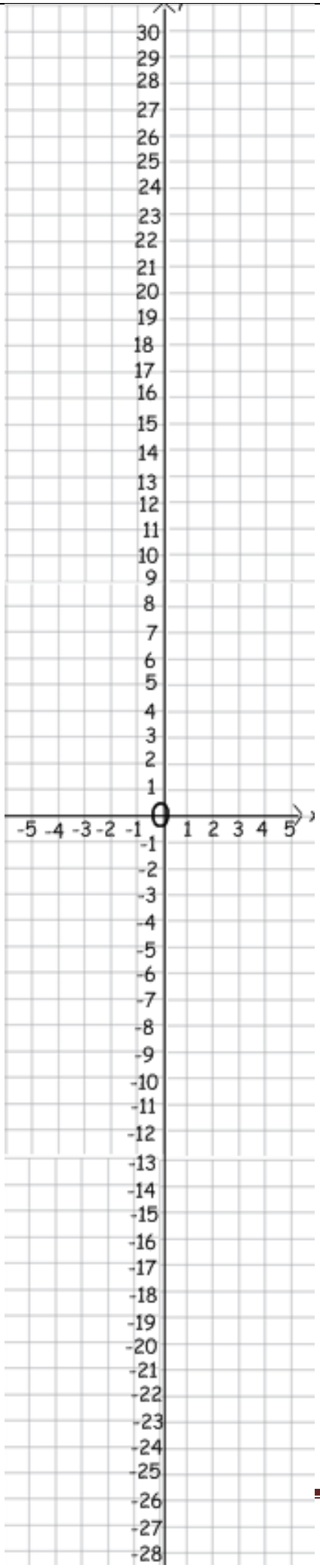
X	-3	-2	-1	0	1	2	3
y							

15) y = 9x - 1

X	-3	-2	-1	0	1	2	3
y							

16) y = 3x + 18

X	-3	-2	-1	0	1	2	3
y							



Complete the table of values and plot the graphs for each equation

17) $y = \frac{1}{2}x$

X	-3	-2	-1	0	1	2	3
y							

18) $y = \frac{1}{2}x + 18$

X	-3	-2	-1	0	1	2	3
y							

19) $y = \frac{1}{2}x + 5$

X	-3	-2	-1	0	1	2	3
y							

20) $y = \frac{1}{2}x - 2$

X	-3	-2	-1	0	1	2	3
y							

21) $y = \frac{1}{2}x + 6$

X	-3	-2	-1	0	1	2	3
y							

22) $y = -x$

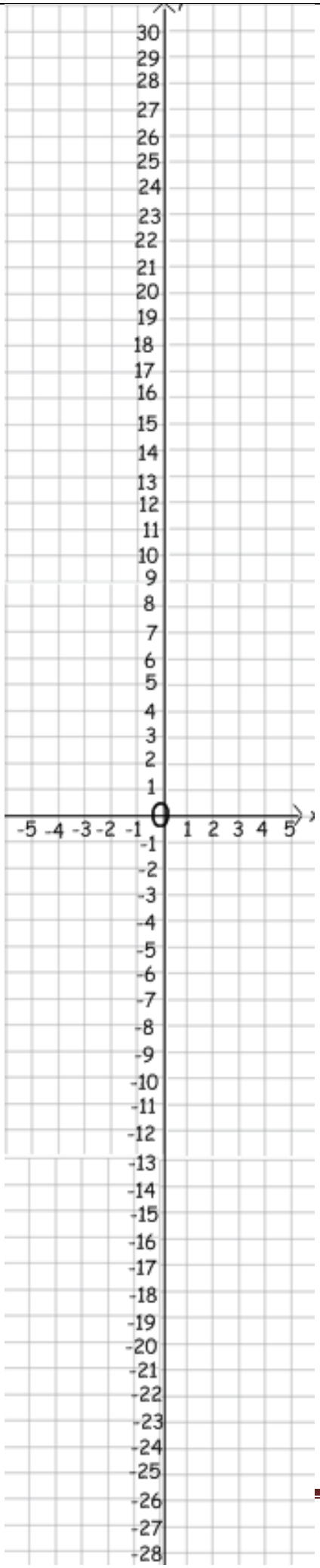
X	-3	-2	-1	0	1	2	3
y							

23) $y = -2x$

X	-3	-2	-1	0	1	2	3
y							

24) $y = -3x$

X	-3	-2	-1	0	1	2	3
y							



Complete the table of values and plot the graphs for each equation

25)y = -x + 4

X	-3	-2	-1	0	1	2	3
y							

26)y = -2x + 8

X	-3	-2	-1	0	1	2	3
y							

27)y = -3x + 15

X	-3	-2	-1	0	1	2	3
y							

28)y = 10 - x

X	-3	-2	-1	0	1	2	3
y							

29)y = 21 - x

X	-3	-2	-1	0	1	2	3
y							

30)y = -3x + 3

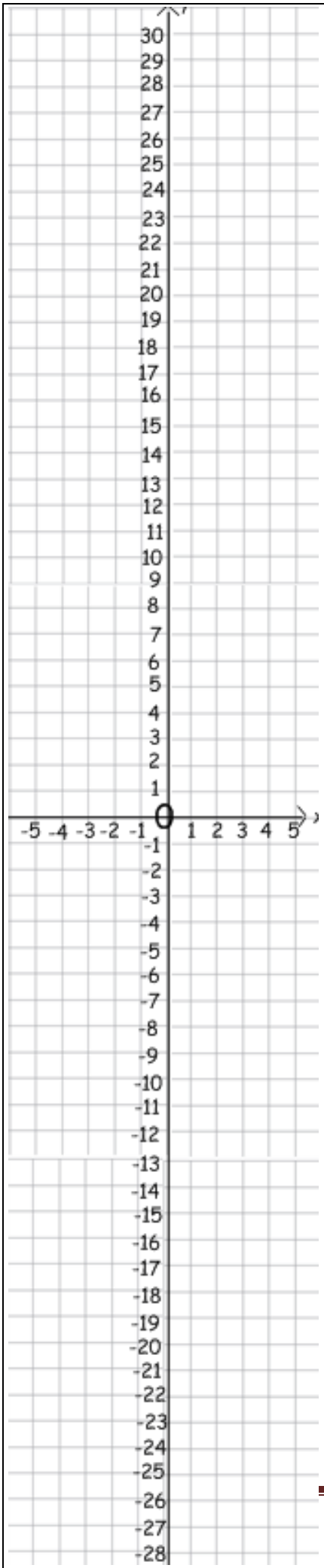
X	-3	-2	-1	0	1	2	3
y							

31) y = -5x - 1

X	-3	-2	-1	0	1	2	3
y							

32) y = 18 – 2x

X	-3	-2	-1	0	1	2	3
y							



Without drawing a table of values, plot the graphs of the following equations.

Plot these ones on the left:

1) $y = 4x - 2$

2) $y = 2x + 5$

3) $y = x + 7$

4) $y = 5x + 5$

5) $y = 7x - 5$

6) $y = \frac{1}{2}x - 2$

7) $x = 5$

8) $y = 10$

9) $y = -10$

10) $x = -2$

Plot these ones on the right:

11) $y = -2x$

12) $y = -3x + 1$

13) $y = 5 - x$

14) $y = 10 - 3x$

15) $y = -5x + 1$

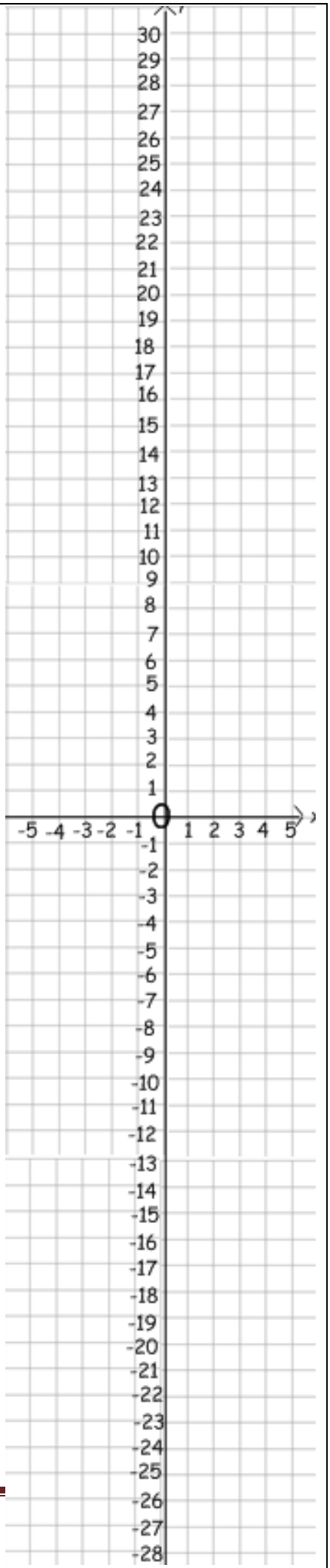
16) $y = -3x + 19$

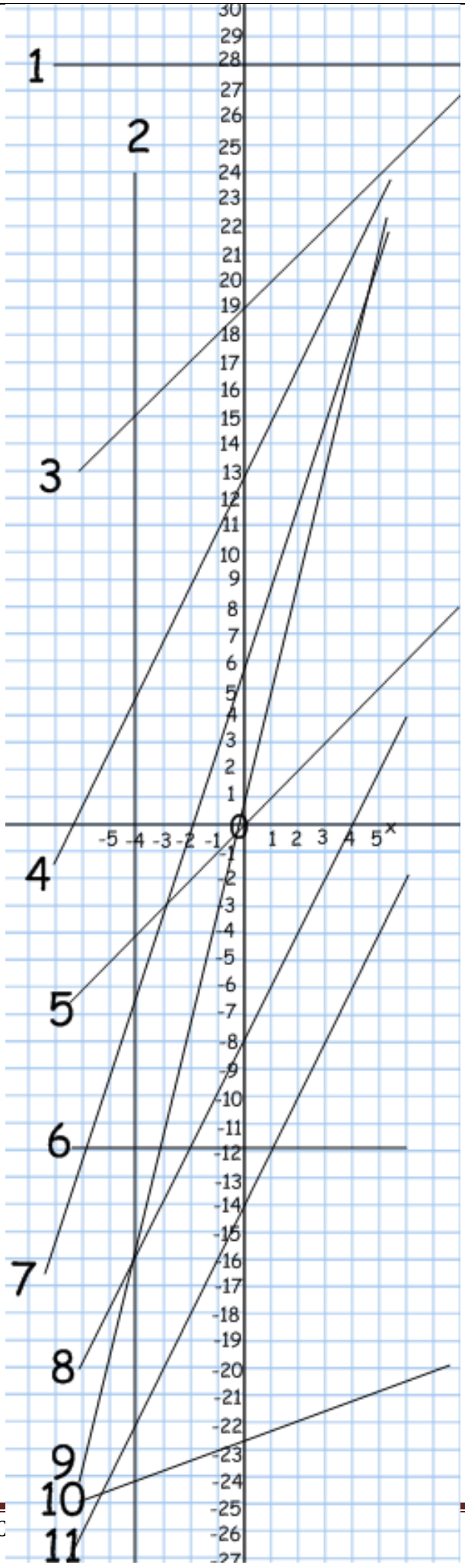
17) $y = -6x - 3$

18) $y = -\frac{1}{2}x - 5$

19) $2x + 2y = 16$

20) $9x + 6y = 24$





Write down the equation of each line in the form y = mx + c.

1)

2)

3)

4)

5)

6)

7)

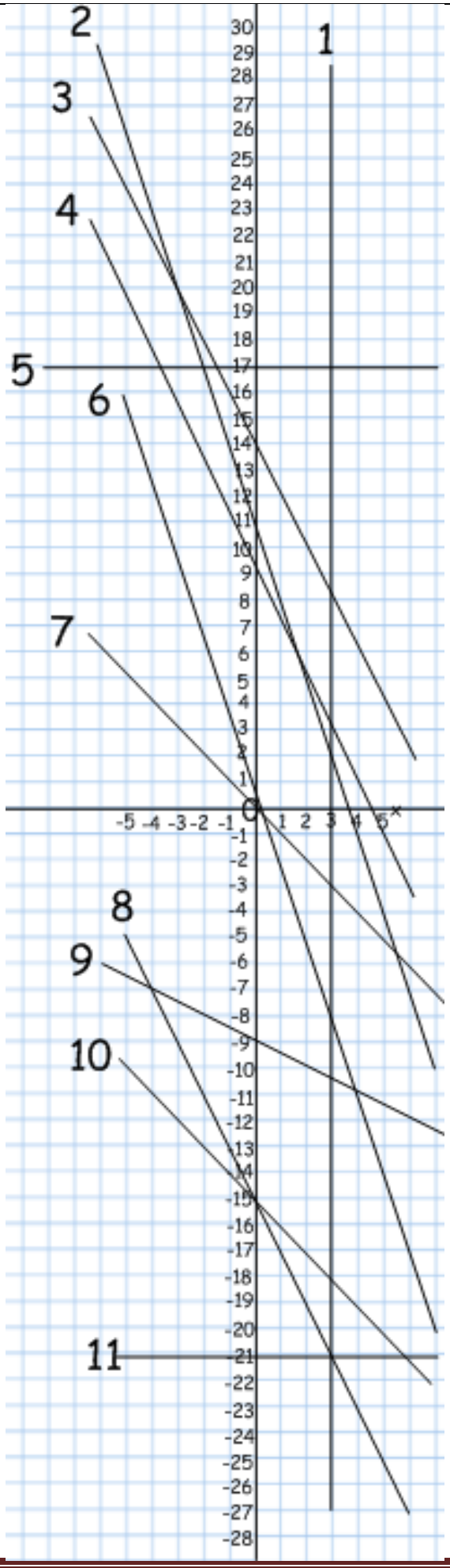
8)

9)

10)

11)

Which equations are parallel lines?



Write down the equation of each line in the form y = mx + c.

1)

2)

3)

4)

5)

6)

7)

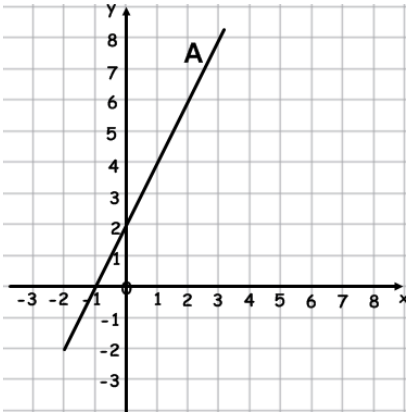
8)

9)

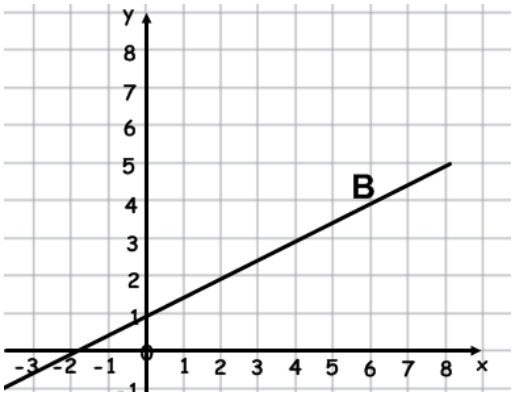
10)

11)

Which equations are parallel lines?

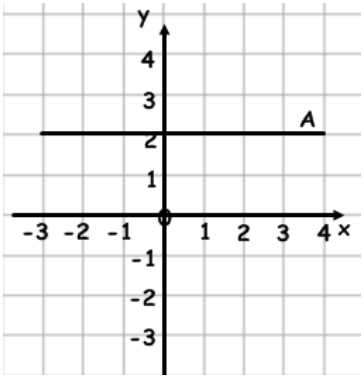


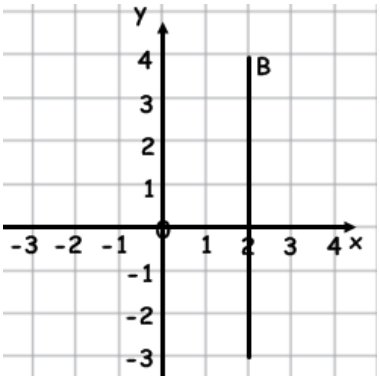
1) Find the equation of line A

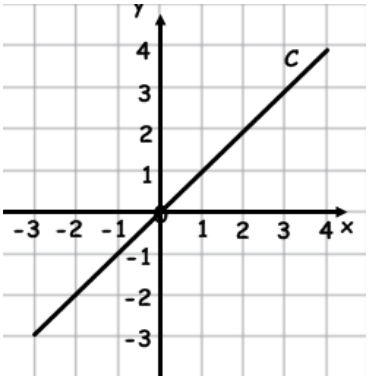


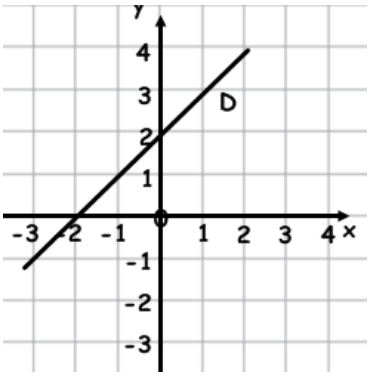
2) Find the equation of line B.

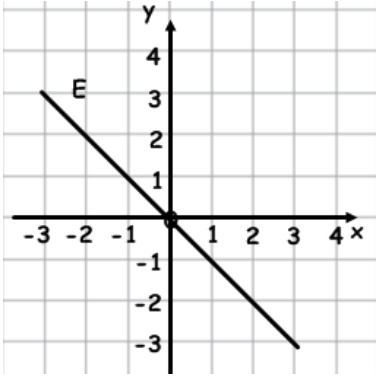
3) Match the graphs to the correct equations.

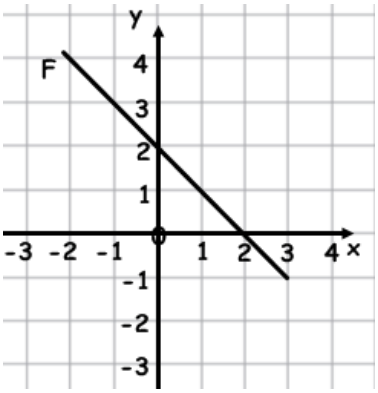












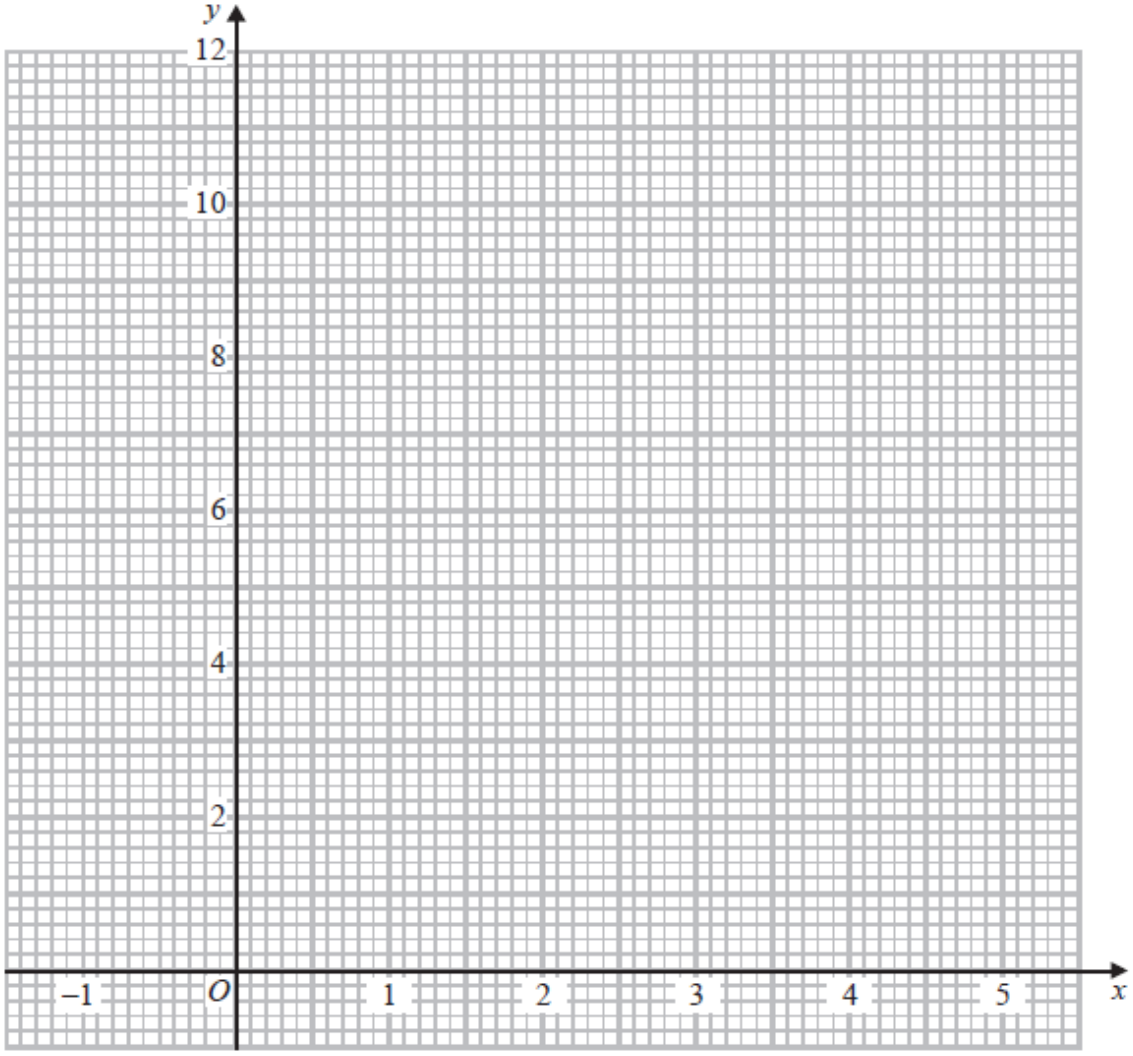
Equation	Graph
y= x	
y = 2	
y = x + 2	
x = 2	
y = -x	
y = 2 - x	

Example Questions
Quadratic, cubic and reciprocal graphs

a) Complete the table of values for $y = x^2 - 3x + 2$

x	−1	0	1	2	3	4	5
y	6				2		12

(b) On the grid, draw the graph of $y = x^2 - 3x + 2$ for values of x from −1 to 5

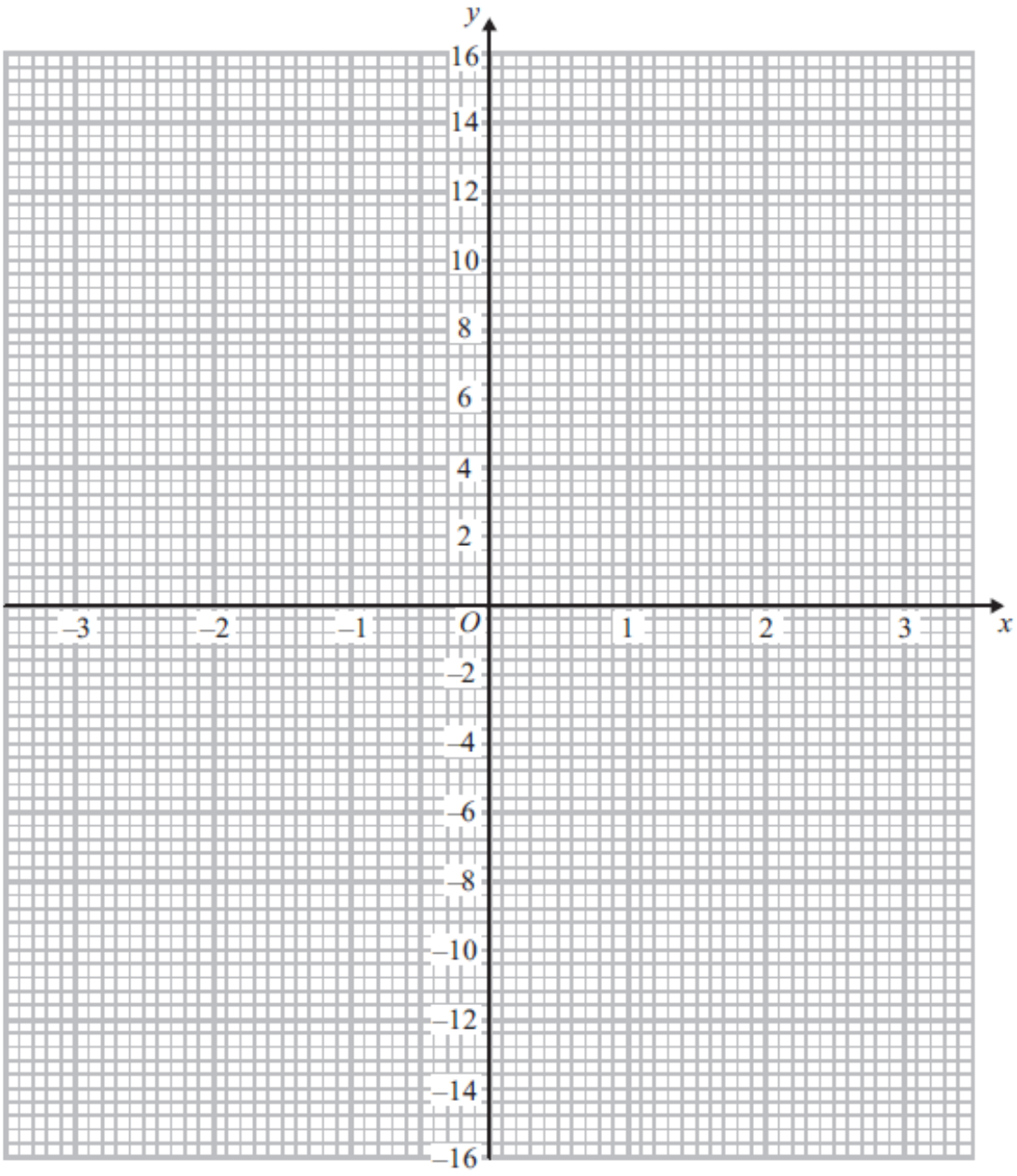


(c) Find estimates for the solutions of the equation $x^2 - 3x + 2 = 4$

a) Complete the table of values for $y = x^3 - 4x$

x	−3	−2	−1	0	1	2	3
y			3	0			15

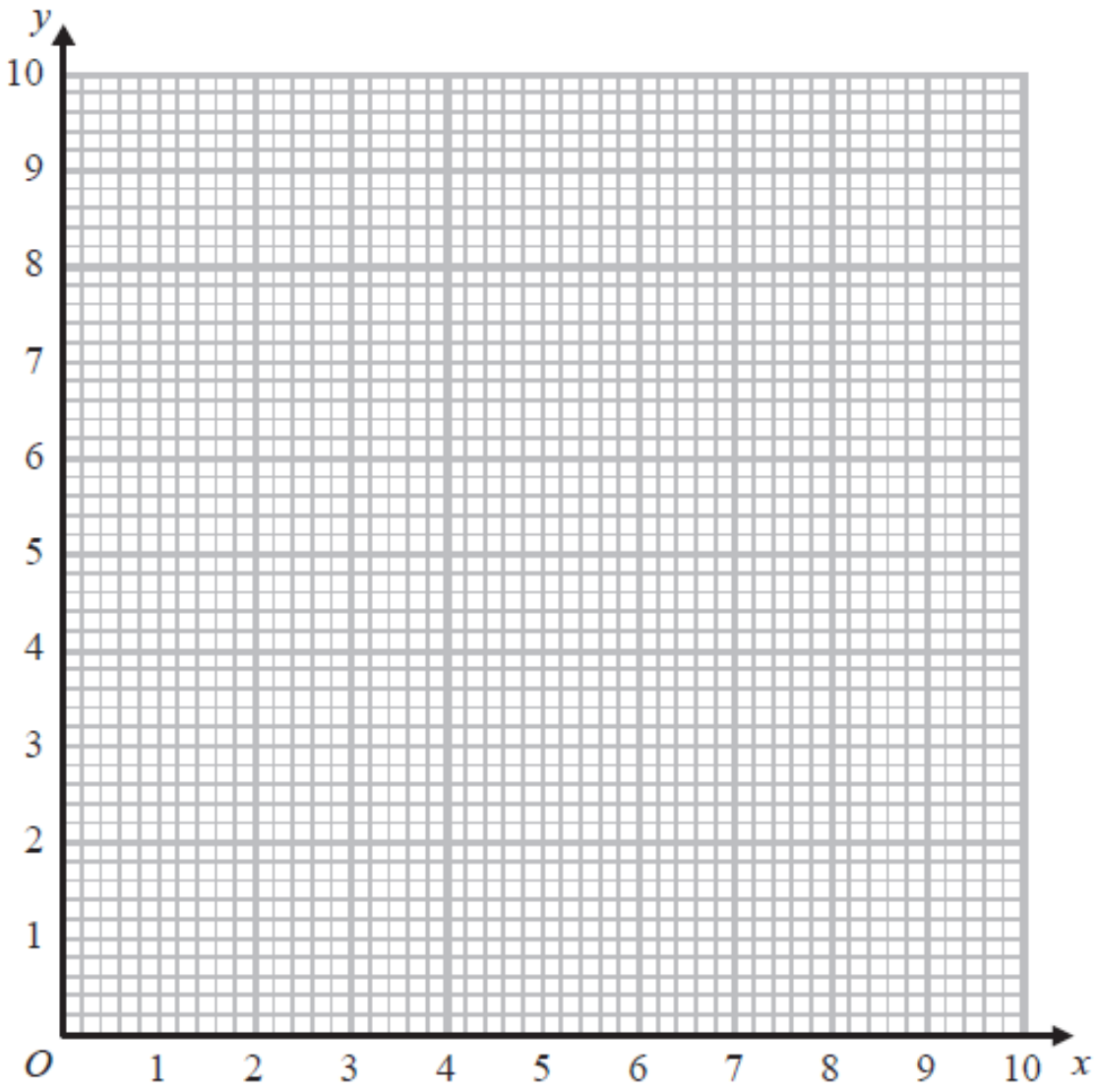
(b) On the grid, draw the graph of $y = x^3 - 4x$ from $x = -3$ to $x = 3$



(a) Complete the table of values for

x	0.5	1	2	4	5	8
y		4	2			

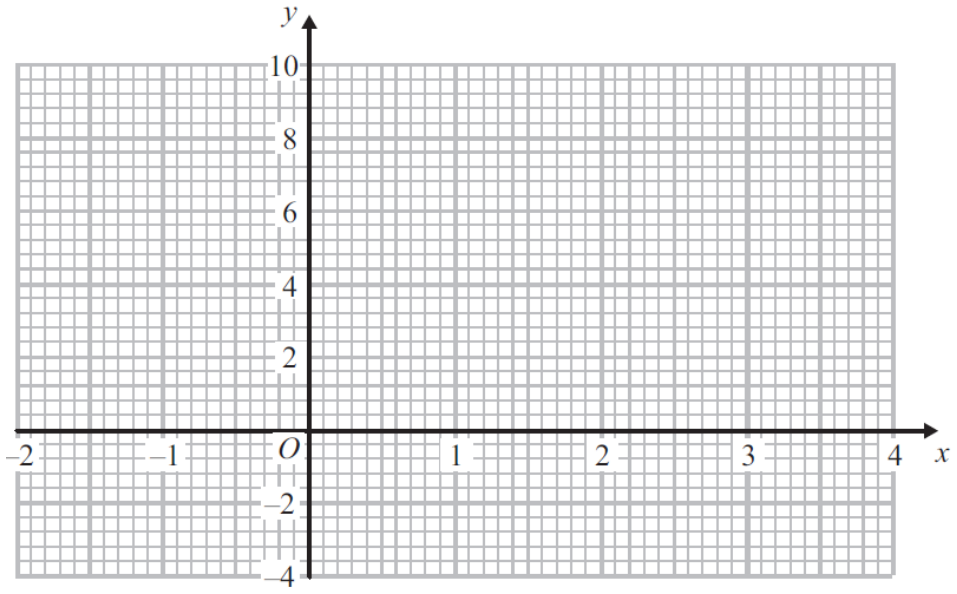
(b) On the grid, draw the graph of $y = \frac{4}{x}$ for $0.5 \leqslant x \leqslant 8$



(a) Complete the table of values for $y = x^2 - 2x$

x	–2	–1	0	1	2	3	4
y		3	0			3	

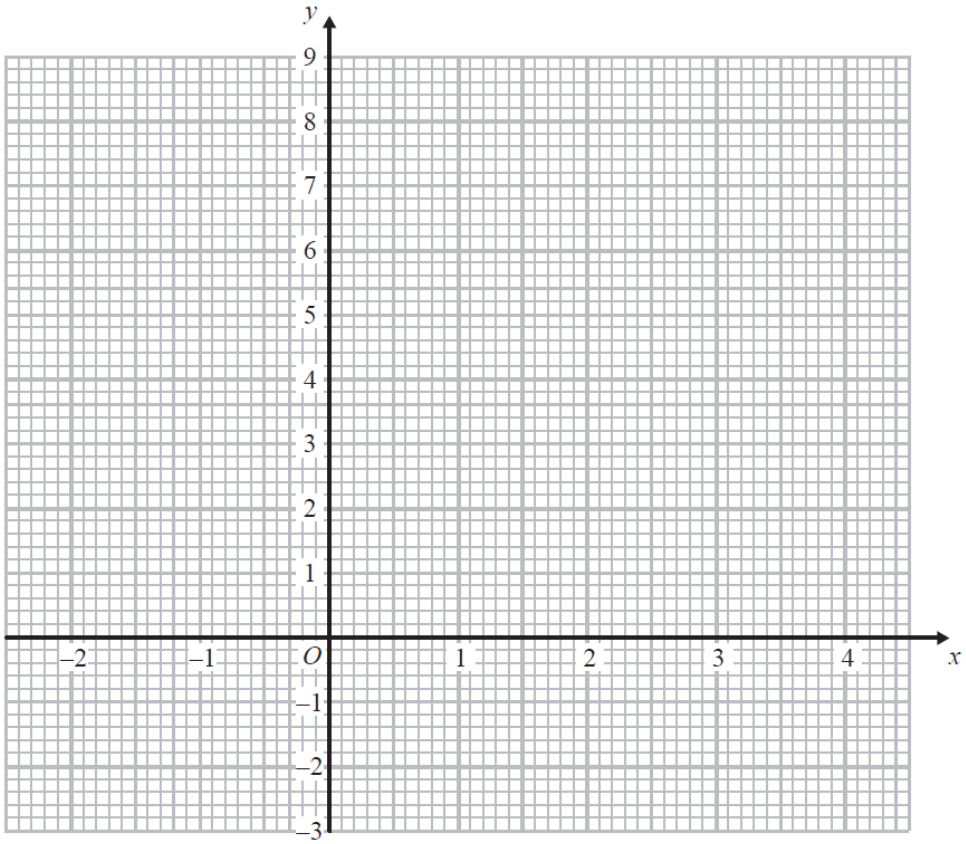
(b) On the grid, draw the graph of $y = x^2 - 2x$ for values of x from –2 to 4



(a) Complete the table of values for $y = x^2 - 2x - 1$.

x	–2	–1	0	1	2	3	4
y	7			–2	–1		

(*b*) On the grid, draw the graph of $y = x^2 - 2x - 1$ for values of x from –2 to 4.

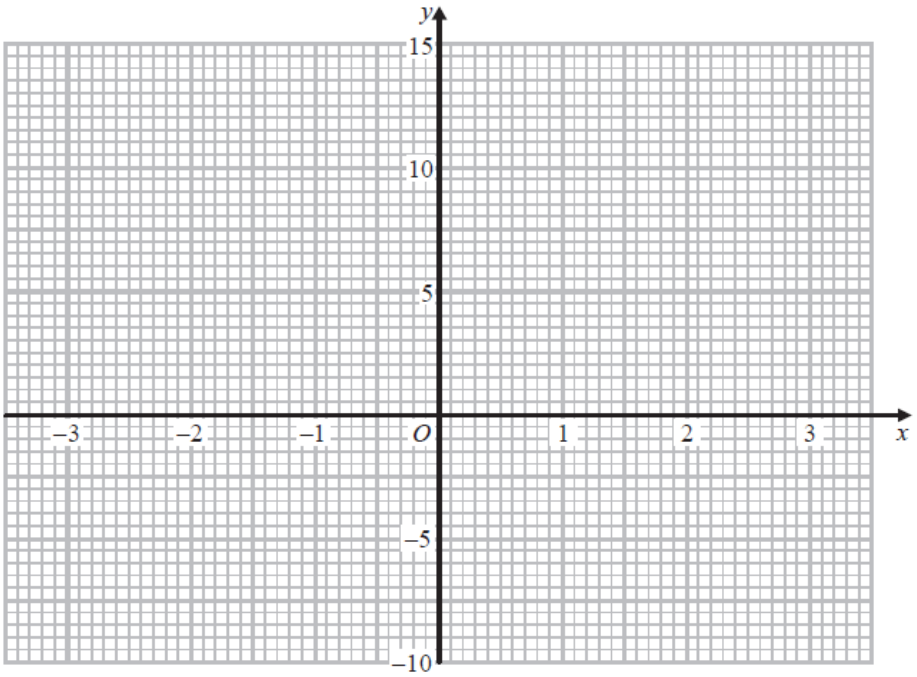


(*c*) Solve $x^2 - 2x - 1 = x + 3$

(a) Complete this table of values for $y = x^2 + x - 4$

x	–3	–2	–1	0	1	2	3
y		–2	–4		–2		

(b) On the grid, draw the graph of $y = x^2 + x - 4$ for values of x from –3 to 3

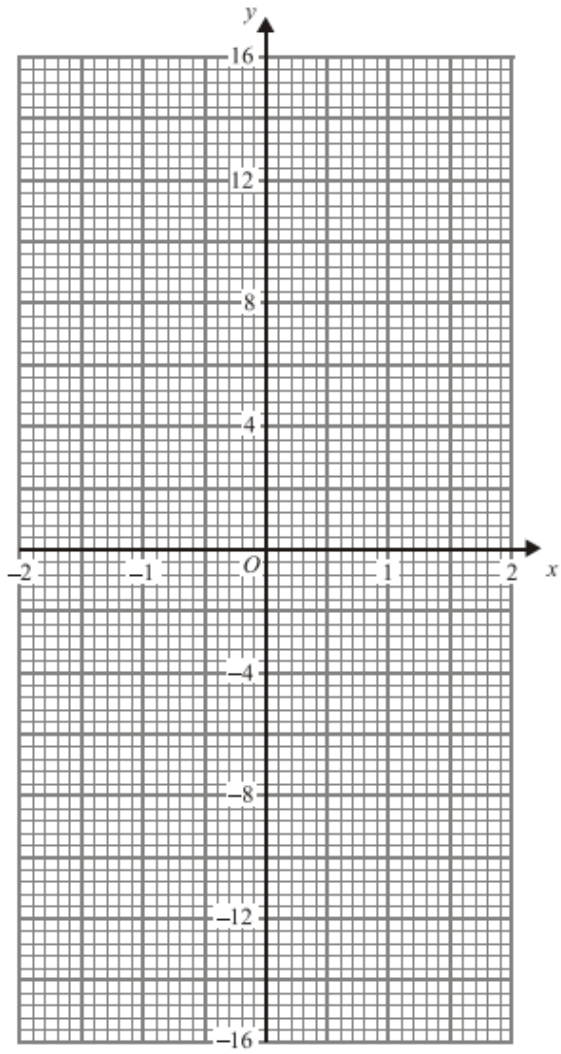


(c) Use the graph to estimate a solution to $x^2 + x - 4 = 0$

(a) Complete the table of values for $y=x^3 +3x$

x	–2	–1	0	1	2
y					

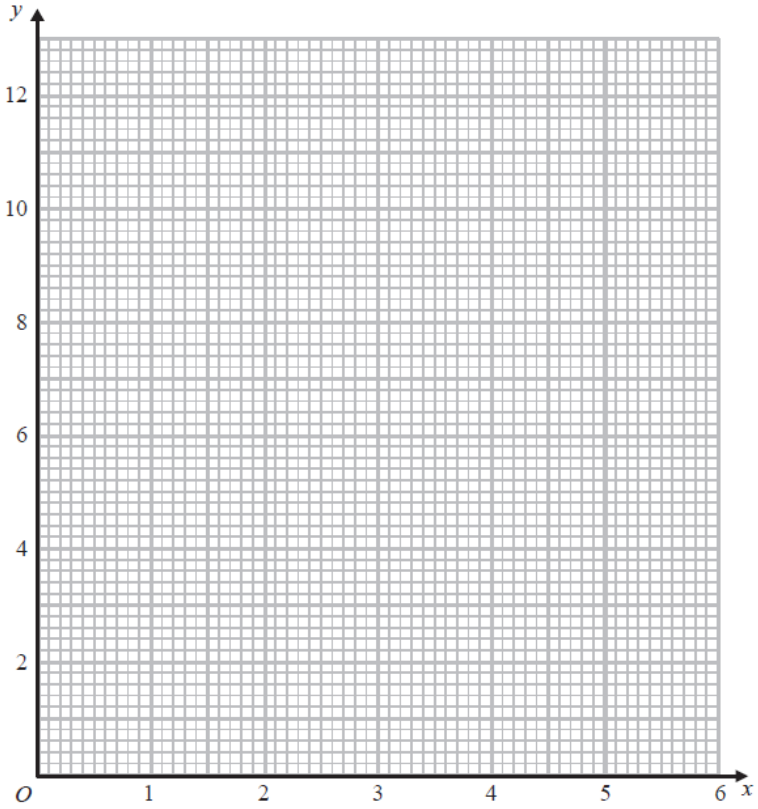
(b) On the grid, draw the graph of $y=x^3+3x$



(a) Complete the table of values for $y = \frac{6}{x}$

x	0.5	1	1.5	2	3	4	5	6
y		6		3		1.5		

(b) On the grid below, draw the graph of $y = \frac{6}{x}$ for values of x from 0.5 to 6

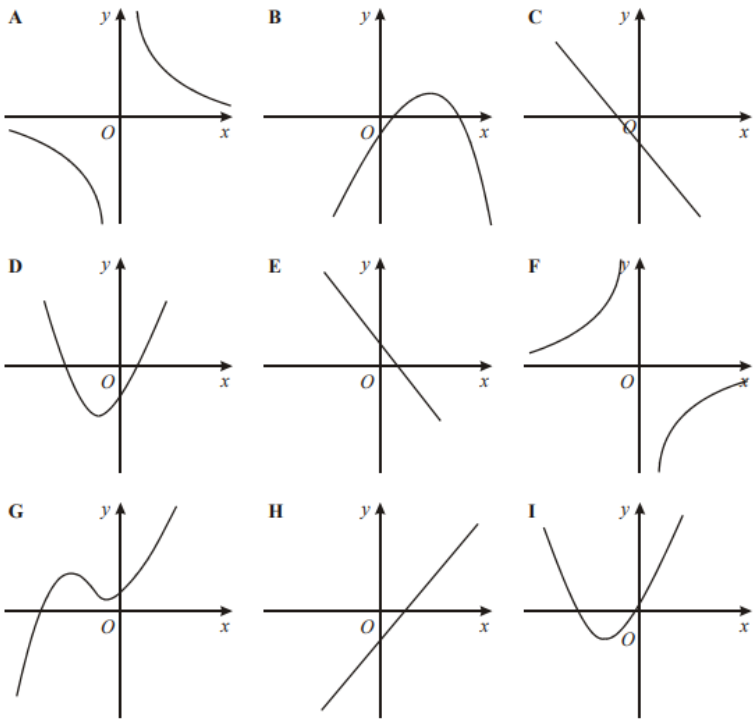


Write down the letter of the graph which could have the equation

$(i)\ y = 3x - 2$

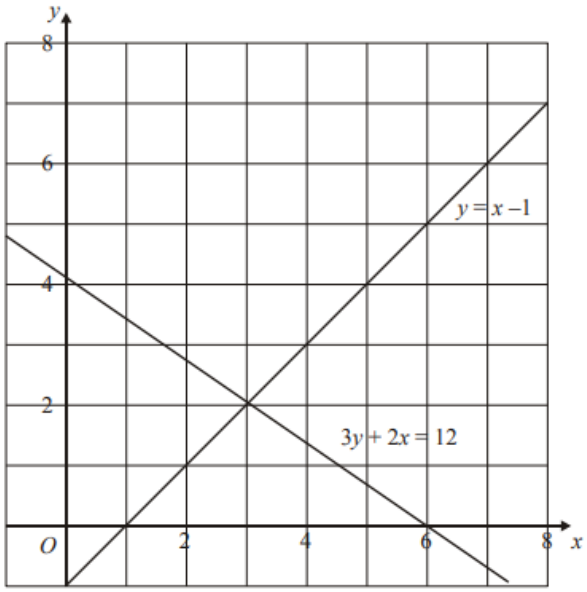
$(ii)\ y = 2x^2 + 5x - 3$

$(iii)\ y = \frac{3}{x}$



Example Questions
Linear simultaneous equations

1) The graphs of the straight lines with equations 3y + 2x = 12 and y = x – 1 have been drawn on the grid.



Use the graphs to solve the simultaneous equations

3y + 2x = 12
y = x –1

x = ...

y = ...

2) Solve the simultaneous equations
$3x + y = -4$
$3x - 4y = 6$

x = ...

y = ...

3) Solve the simultaneous equations
$x + 3y = 12$
$5x - y = 4$

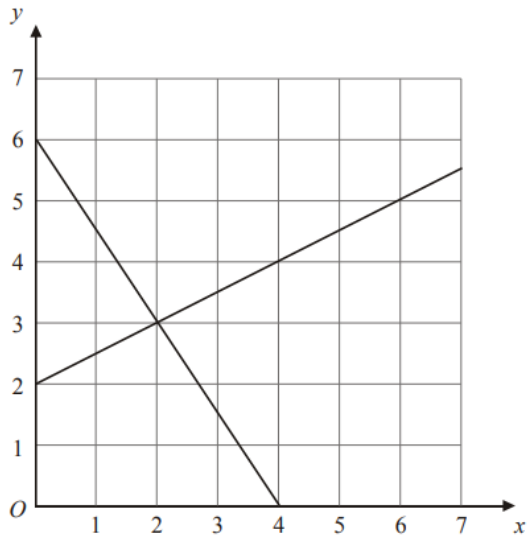
x = ...

y = ...

4) Solve the simultaneous equations
3x + 2y = 4
4x + 5y = 17

x = ...

y = ...



The diagram shows graphs of $y = \frac{1}{2}x + 2$

and $2y + 3x = 12$

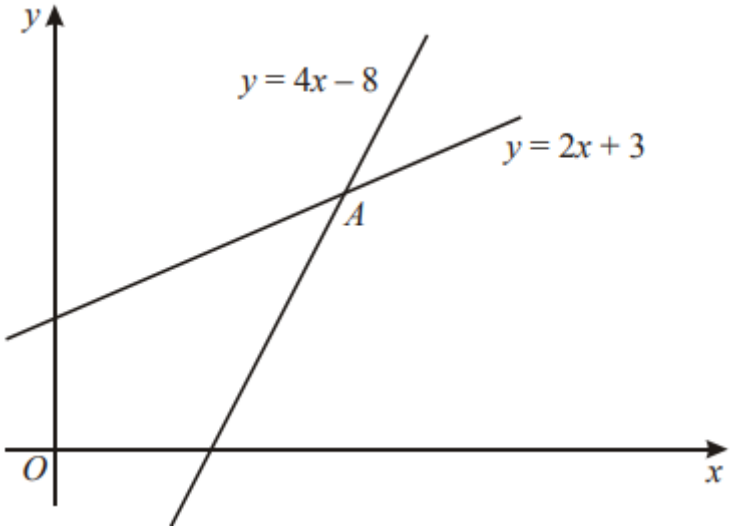
(a) Use the diagram to solve the simultaneous equations

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

$$2y + 3x = 12$$

x = ...

y = ...



The diagram shows two straight lines intersecting at point A.
The equations of the lines are
y = 4x – 8
y = 2x + 3
Work out the coordinates of A.

(.....,.....)

Solve

Q1) 5x + 2y = 24
3x + 2y = 16

x = ...

y = ...

Q2) 6x - 2y = 2
6x - y = 7

x = ...

y = ...

Q3)$9x-2y=6$
$5x-2y=-2$

x = ...

y = ...

Q4) $4x-3y=1$
$5x+3y=35$

x = ...

y = ...

Q5) $2x+2y=20$
$2x-3y=-10$

x = ...

y = ...

Q6) $8x - 5y = 7$
$8x - 4y = 12$

x = ...

y = ...

Q7) $3x - 2y = 16$
$x - 2y = 4$

x = ...

y = ...

Q8) $4x - 2y = 6$
$4x - y = 5$

x = ...

y = ...

Q9) $4x + y = 17$
$3x + 2y = 19$

x = ...

y = ...

10) $2x + y = 17$
$3x + 2y = 27$

x = ...

y = ...

11) $5x + y = 22$
$3x + 3y = 18$

x = ...

y = ...

12) $5x + 2y = 11$
$4x - 3y = 18$

x = ...

y = ...

13) $6x - 2y = 33$
$4x + 3y = 9$

x = ...

y = ...

14) A cinema sells adult tickets and child tickets.
The total cost of 3 adult tickets and 1 child ticket is £30
The total cost of 1 adult ticket and 3 child tickets is £22
Work out the cost of an adult ticket and the cost of a child ticket.

adult ticket £.....

child ticket £.....