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- 1 Factorise:
a $12a + 8b$ **b** $xy - 2x$ **c** $2k^2 + 6k$ **d** $3pq^2 - 12p^2r$
- 2 **a** Write down all of the whole number values of x , such that $-5 < x \leq 3$
b Represent the inequality $-5 < x \leq 3$ on a number line.
- 3 Remove the brackets and then simplify:
a $3(5x + y) + 2(3y - 2x)$ **b** $5(2m + 3) - 3(4 - m)$
- 4 Here are the first five numbers of a sequence.
 3, 9, 15, 21, 27
a Write down the next two numbers in the sequence.
b Write down, in words, the term-to-term rule to continue this sequence.
c Write down an expression for the n th term of this sequence.
d What will the 20th term of the sequence be?
- 5 Solve the inequality $6y - 4 \leq 2y + 7$
- 6 Solve the following equations:
a $4(a + 3) = 6(a - 1)$ **b** $\frac{x+1}{2} - \frac{2x-3}{5} = 1$
- 7 Starting with $x = 4$, use a trial and improvement method to find, correct to one decimal place, a solution to the equation $x^3 + x = 84$
 Show all your working.
- 8 **a** Copy and complete the table for $y = x^2 - 2x - 2$

x	-2	-1	0	1	2	3	4
y	6		-2			1	

- b** Draw x - and y -axes with the x -axis from -2 to 4 and the y -axis from -4 to 6.
 On the axes, draw the graph of $y = x^2 - 2x - 2$ for values of x from -2 to 4.
 - c** Write down the equation of the line of symmetry of the graph.
 - d** Write down the coordinates of the minimum point on the graph.
 - e** Use your graph find the values of x when $y = 0$
- 9 In each of the following, make a the subject of the formula.
a $2q = p + at$ **b** $v = \frac{3a}{2} - 5$ **c** $d = \sqrt{3a + c}$ **d** $4a - m = n + aq$

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10 M is the point $(-2, 4)$ and N is the point $(6, -8)$.

- Find the coordinates of the midpoint of the line MN .
- Find the gradient of the line MN .
- Find the equation of this line.
- Another line PQ is parallel to MN and passes through the point $(1, 5)$.
Find the equation of PQ .

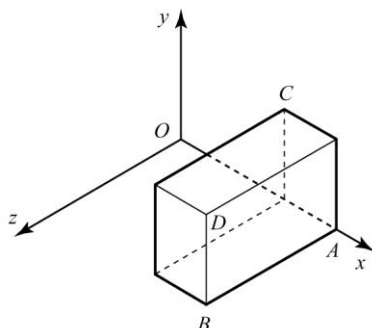
11 The diagram shows a cuboid.

The coordinates of point A are $(6, 0, 0)$.

The coordinates of point B are $(6, 0, 5)$.

The coordinates of point C are $(4, 3, 0)$.

Write down the coordinates of point D .



12 Solve these pairs of simultaneous equations:

a $3x + 2y = 12$
 $x + 2y = 2$

b $5x - 2y = 7$
 $x + 2y = 11$

c $7x - 3y = 48$
 $2x + y = 10$

d $3x - 4y = 14$
 $5x + 3y = -54$

13 a Copy and complete the table of values for $y = x^3 - 2x^2 - 4x$

x	-3	-2	-1	0	1	2	3	4
y	-33			0			-3	

b Draw the graph of $y = x^3 - 2x^2 - 4x$ for values of x from -3 to 4.

c Use your graph to solve the equations

i $x^3 - 2x^2 - 4x = 1$

ii $x^3 - 2x^2 - 4x = -5$

14 a Multiply out and simplify:

i $(x + 4)(x + 7)$

ii $(x - 6)(x + 3)$

iii $(x + 5)(x - 5)$

iv $(3x + 2)(5x - 4)$

b Factorise:

i $x^2 + 3x - 18$

ii $x^2 - 9x + 20$

iii $2x^2 - 5x - 3$

iv $6x^2 - 27x + 30$

15 Simplify:

a $\frac{x^2 - 9}{3x - 9}$

b $\frac{2x^2 + 5x - 3}{8x - 4}$

c $\frac{x^2 - 6x + 8}{x^2 - 4}$

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16 Solve each of these quadratic equations:

a $x^2 + 2x - 24 = 0$

b $x^2 + 6x = 0$

c $x^2 - 64 = 0$

d $2x^2 + 5x - 12 = 0$

17 Solve these equations, giving each answer correct to two decimal places.

a $x^2 + 7x + 8 = 0$

b $x^2 - 3x + 1 = 0$

c $2x^2 + 10x - 3 = 0$

18 a Sketch the graph of $y = \cos x$ for values of x from 0° to 360° .

b Use your sketch, together with your calculator, to solve the equation $\cos x = -0.4$.
Find all the solutions for x that lie between 0° and 360° .

Give your solutions correct to 1 decimal place.

19 Solve these quadratic equations by completing the square.

a $x^2 - 8x + 1 = 0$

b $x^2 + 4x + 2 = 0$

c $x^2 + 2x - 4 = 0$

20 Each of the equations in the table represents one of the graphs A to F.

Copy and complete the table, writing the letter of each graph alongside the correct equation.

Equation	Graph
$y = x^2 + 2x - 1$	
$y = x^3 - 3x$	
$y = 3x - x^3$	
$y = 4x - x^2$	
$y = \frac{4}{x}$	
$y = x^2 - 2$	

