1   Work out $\frac{7}{11}$ of $198\,\text{kg}$.

.... kg [1]

2   Factorise.
$$y - 2y^2$$

....[1]

3   Work out $1.45 as a percentage of $72.50.

.... % [1]

4   Calculate.
$$\frac{5.39 - 0.98}{0.743 - 0.0743}$$

....[1]

5   Work out. $\left(\dfrac{125}{27}\right)^{-\frac{2}{3}}$

....[1]

6   **(a)**   Write the number five million, two hundred and seven in figures.

....[1]

(b)   Write $0.008\,13$ in standard form.

....[1]

7 Simplify.
$$2p - q - 3q - 5p$$

.... [2]

8 Write these numbers correct to 2 significant figures.

(a) 0.076 499

.... [1]

(b) 10 100

.... [1]

9 **Without using a calculator**, work out $\frac{1}{4} \div \frac{2}{3}$.

You must show all your working and give your answer as a fraction.

.... [2]

10 Solve.
$$3w - 7 = 32$$

$w =$ .... [2]

11 $A = \pi r l + \pi r^2$

Rearrange this formula to make l the subject.

$l =$ .... [2]

12 The area of a square is $42.5\,\text{cm}^2$, correct to the nearest $0.5\,\text{cm}^2$.

Calculate the lower bound of the length of the side of the square.

.... cm [2]

13 Change the recurring decimal $0.1\dot{8}$ to a fraction.
You must show all your working.

.... [2]

14 Describe fully the **single** transformation represented by the matrix $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$.

....

.... [2]

15 A car travels at 108 km/h for 20 seconds.

Calculate the distance the car travels.
Give your answer in metres.

.... m [3]

16 (a) Simplify $\dfrac{w^2}{w^3}$.

.... [1]

(b) Simplify $(3w^3)^3$.

.... [2]

17 y is directly proportional to the square root of x.
When $x = 9$, $y = 6$.

Find y when $x = 25$.

$y =$ .... [3]

18 Write as a single fraction in its simplest form.

$$\frac{1}{x} - \frac{1}{x+1}$$

.... [3]

19

NOT TO
SCALE

72°

6 cm
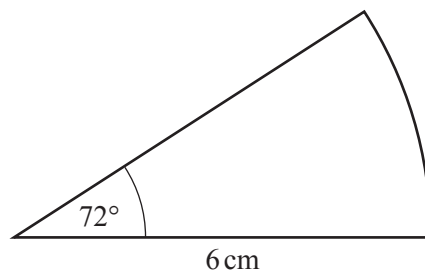
The diagram shows a sector of a circle with radius 6 cm and sector angle 72°.
The perimeter of this sector is $(p + q\pi)$ cm.
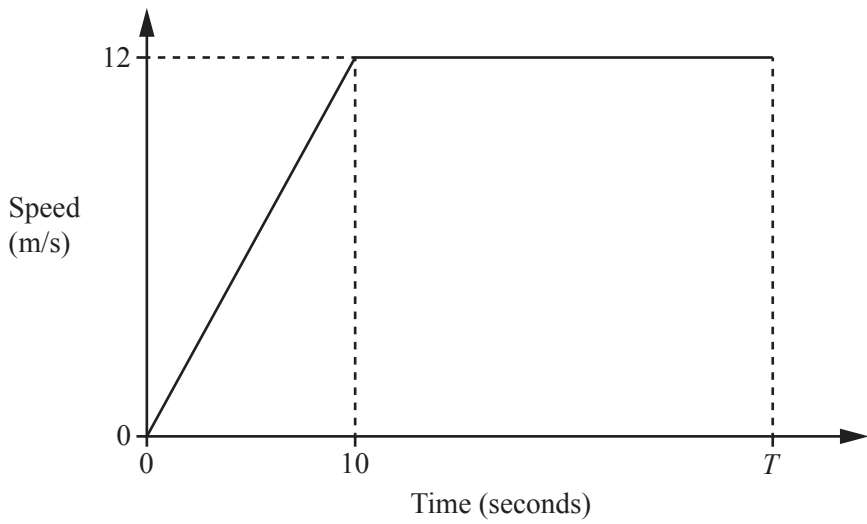
Find the value of p and the value of q.

$p =$ ....

$q =$ .... [3]

20 Solve the equation $3x^2 - 2x - 2 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$x =$ .... or $x =$ .... [4]

21

The diagram shows the speed−time graph for the first T seconds of a car journey.

(a) Find the acceleration during the first 10 seconds.

.... m/s^2 [1]

(b) The total distance travelled during the T seconds is 480 m.

Find the value of T.

$T =$ .... [3]

22 Simplify.

$$\frac{2x^2 - x - 1}{2x^2 + x}$$

.... [4]

23
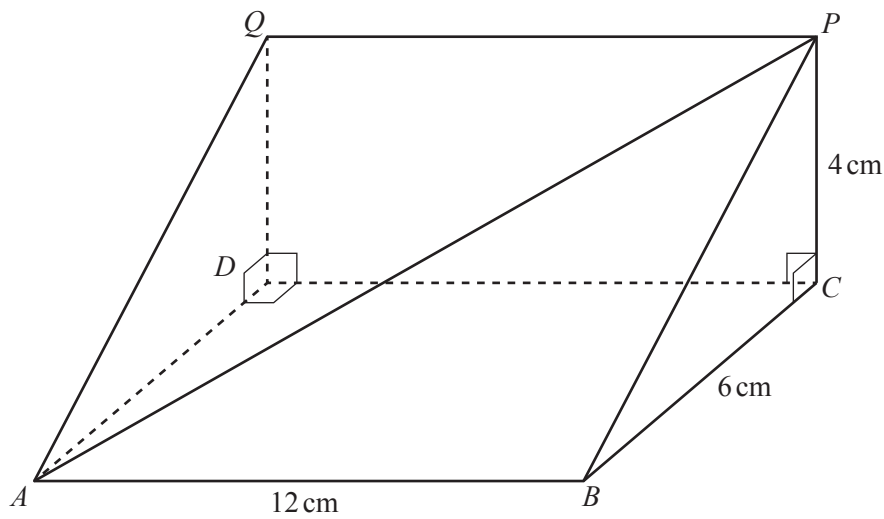
The diagram shows a triangular prism.
$AB = 12$ cm, $BC = 6$ cm, $PC = 4$ cm, angle $BCP = 90°$ and angle $QDC = 90°$.

Calculate the angle between AP and the rectangular base $ABCD$.

.... [4]

24 $\mathbf{P} = \begin{pmatrix} 3 & 1 \\ 2 & 3 \end{pmatrix}$ $\mathbf{Q} = \begin{pmatrix} 1 & 2 \\ -1 & 4 \end{pmatrix}$

Find

(a) $3\mathbf{P}$,

$3\mathbf{P} = \begin{pmatrix} & \\ & \end{pmatrix}$ [1]

(b) $\mathbf{PQ}$,

$\mathbf{PQ} = \begin{pmatrix} & \\ & \end{pmatrix}$ [2]

(c) $\mathbf{Q}^{-1}$.

$\mathbf{Q}^{-1} = \begin{pmatrix} & \\ & \end{pmatrix}$ [2]
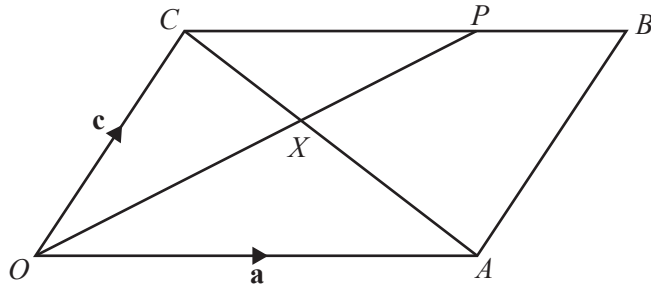
25 Factorise completely.

(a) $px + py - x - y$

.... [2]

(b) $2t^2 - 98m^2$

.... [3]

26

NOT TO
SCALE

In the diagram, $OABC$ is a parallelogram.
OP and CA intersect at X and $CP : PB = 2 : 1$.
$\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OC} = \mathbf{c}$.

(a) Find $\overrightarrow{OP}$, in terms of $\mathbf{a}$ and $\mathbf{c}$, in its simplest form.

$\overrightarrow{OP} =$ .... [2]

(b) $CX : XA = 2 : 3$

(i) Find $\overrightarrow{OX}$, in terms of $\mathbf{a}$ and $\mathbf{c}$, in its simplest form.

$\overrightarrow{OX} =$ .... [2]

(ii) Find $OX : XP$.

$OX : XP =$ .... : .... [2]