

- 1 Write down a common multiple of 18 and 24.



..... [1]

- 2 A train journey starts at 23 40 and finishes at 06 50.



Work out the time taken for this journey.

..... h min [1]

- 3 Write 32 cm as a fraction of 2 m.



Give your answer in its simplest form.

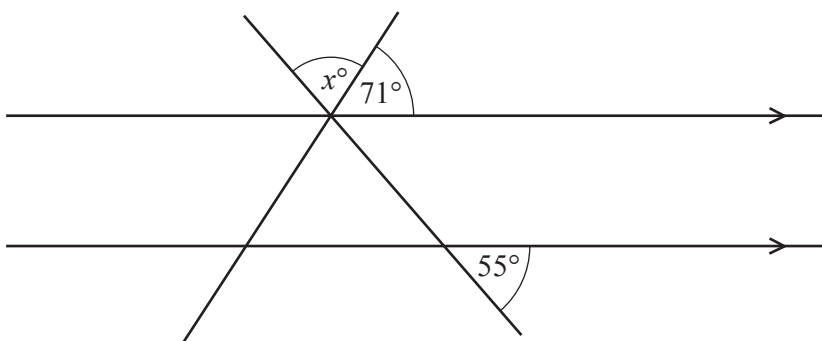
..... [2]

- 4 Divide \$200 in the ratio 7 : 3.



\$, \$ [2]

5



NOT TO
SCALE

The diagram shows two straight lines intersecting two parallel lines.

Find the value of x .

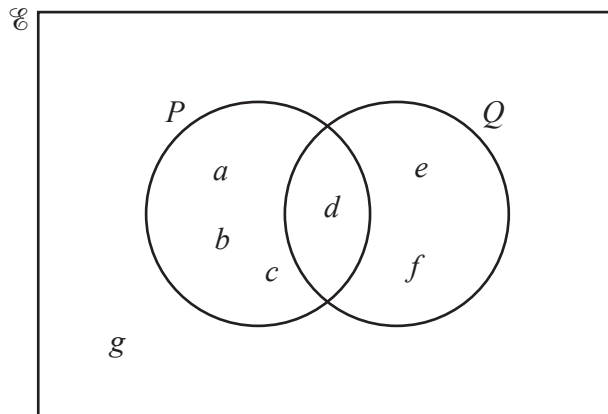
$x =$ [2]

- 6 The price of a computer is \$520.
 This price is reduced by 15% in a sale.

Work out the sale price.

\$ [2]

- 7

The Venn diagram shows the elements of the sets \mathcal{E} , P and Q .

Complete the statements.

(a) $P = \{ \dots \}$ [1]

(b) $n(P \cup Q) = \dots$ [1]

- 8 (a) 3, 9, 27, 81, ...

 Write down the next term in this sequence.

..... [1]

- (b) 13, 17, 21, 25, ...

Find the n th term of this sequence.

..... [2]

9 Without using a calculator, work out $\frac{1}{3} + \frac{5}{6}$.



You must show all your working and give your answer as a mixed number in its simplest form.

..... [2]

10 Simplify $18x^{18} \div 9x^9$.



..... [2]

11 Solve the simultaneous equations.

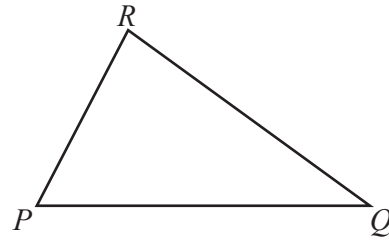
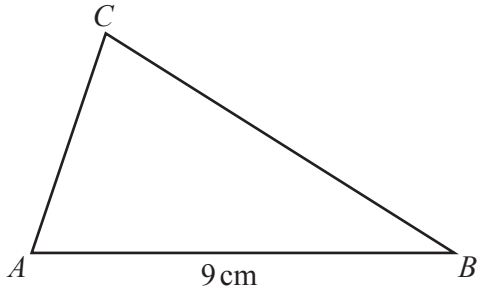


$$\begin{aligned}x - 3y &= 7 \\ 2x - 3y &= 11\end{aligned}$$

$x =$

$y =$ [2]

12



NOT TO SCALE

Triangle PQR is similar to triangle ABC with $\frac{PR}{AC} = \frac{2}{3}$.

$AB = 9$ cm and the area of triangle ABC is 18 cm².

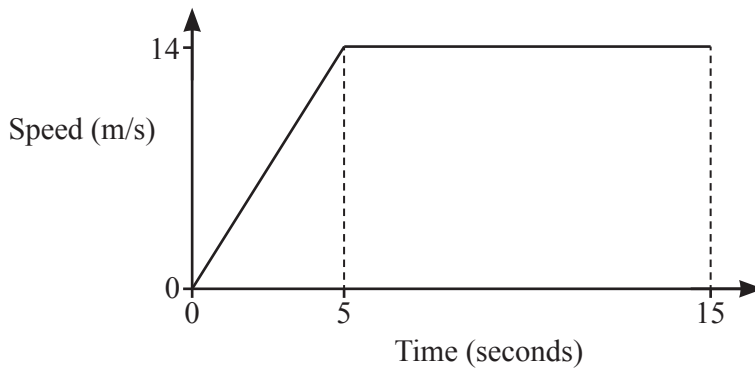
(a) Find the length of PQ .

..... cm [1]

(b) Find the area of triangle PQR .

..... cm² [2]

13



NOT TO SCALE

The diagram shows the speed–time graph of the first 15 seconds of a car journey.

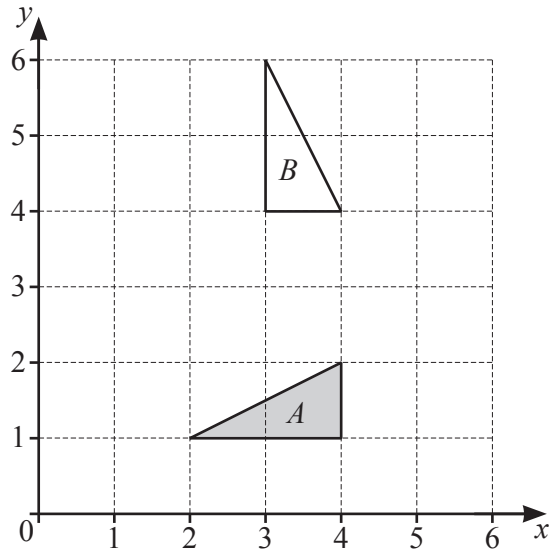
(a) Find the acceleration of the car during the first 5 seconds.

..... m/s² [1]

(b) Find the distance travelled during the 15 seconds.

..... m [2]

14



Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

.....

..... [3]

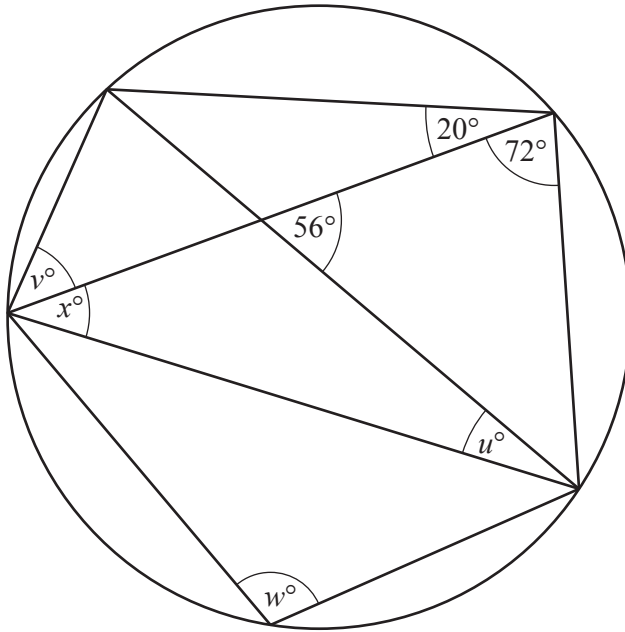
15 The perimeter of a sector of a circle with radius 8 cm is 26 cm.



Calculate the angle of this sector.

..... [3]

16



NOT TO SCALE

The diagram shows a circle and eight chords.

Calculate the values of u , v , w and x .

$u = \dots\dots\dots$

$v = \dots\dots\dots$

$w = \dots\dots\dots$

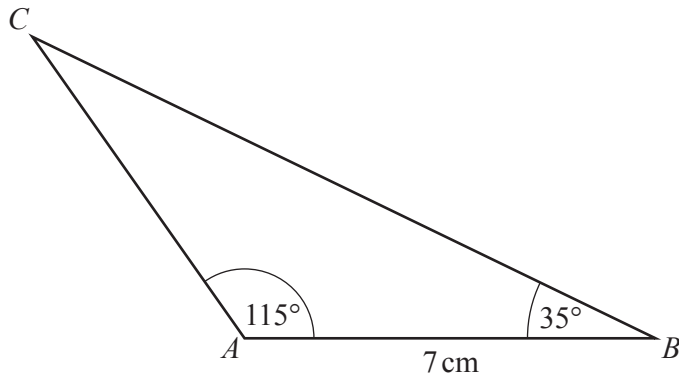
$x = \dots\dots\dots [4]$

17 Simplify $(3125x^{3125})^{\frac{1}{5}}$.



$\dots\dots\dots [2]$

18

NOT TO
SCALECalculate the length BC . $BC = \dots\dots\dots$ cm [4]

19 Expand and simplify.



$(2x + 3)(x - 2)^2$

 $\dots\dots\dots$ [3]

20 Factorise completely.



(a) $1 + x - y - xy$

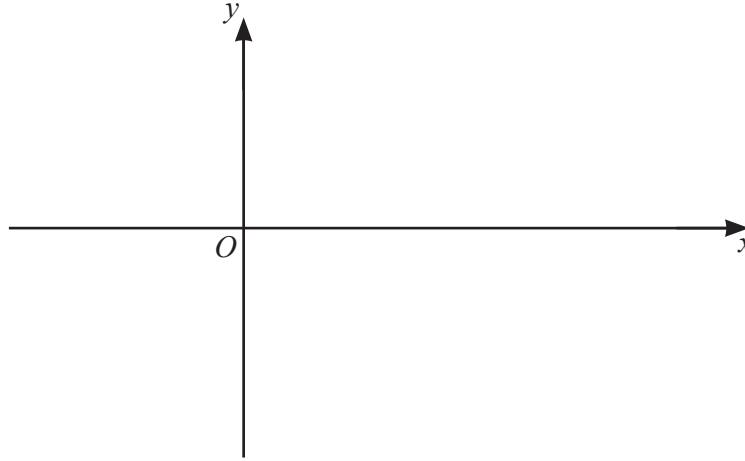
 $\dots\dots\dots$ [2]

(b) $2x^3 - 18xy^2$

 $\dots\dots\dots$ [3]

- 21 The graph of a cubic function has two turning points.
 When $x < 0$ and when $x > 4$ the gradient of the graph is positive.
 When $0 < x < 4$ the gradient of the graph is negative.
 The graph passes through the origin.

Sketch the graph.



[2]

22

7



- (a) On the diagram, sketch the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$. [2]
- (b) Solve the equation $\cos x = -\frac{1}{2}$ for $0^\circ \leq x \leq 360^\circ$.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

- 23 y is inversely proportional to \sqrt{x} and x is directly proportional to w^2 .
When $w = 12$, $y = 12$.

7

Find y in terms of w .

$$y = \dots\dots\dots [3]$$

- 24 Violet and Wilfred recorded their times to run 200 m, correct to the nearest second.
Violet took 36 seconds and Wilfred took 39 seconds.

7

Work out the upper bound of the difference between their times.

$$\dots\dots\dots \text{ s } [2]$$

25 A bag contains 5 red balls, 4 blue balls and 3 green balls.



(a) (i) Megan picks a ball at random.

Write down the probability that the ball is red or blue.

..... [1]

(ii) Megan replaces the ball.
She picks a ball at random, notes the colour and replaces the ball.
She repeats this 60 times.

Calculate the number of times the ball is expected to be red or blue.

..... [1]

(b) Mick picks 2 of the 12 balls at random, without replacement.

Calculate the probability that the balls are different colours.

..... [4]

(c) Marie picks balls at random, without replacement, from the 12 balls.
When she picks a green ball she stops.

The probability that she picks a green ball on pick n is $\frac{21}{220}$.

Find the value of n .

$n =$ [2]