

- 1 Write the number two million two thousand and two in figures.



.....

- 2 Put one pair of brackets into this calculation to make it correct.



$$5 - 4 \times 3 - 9 - 2 = 0$$

[1]

- 3 Simplify.



$$7x - 8y - x - y$$

..... [2]

- 4 The base of a cuboid measures 10 cm by 7 cm.
The volume of the cuboid is 280 cm^3 .



Calculate the height of the cuboid.

..... cm [2]

- 5 In a city, the probability that it will rain today is 0.15 .



Find the probability that it will not rain today in this city.

..... [1]


- 6 Factorise completely.



$$4x^2y - 5xy^2$$

..... [2]


7 The scale of a map is 1 : 40 000.

 On the map the distance between two villages is 37 cm.

Calculate the actual distance between the two villages.
Give your answer in kilometres.

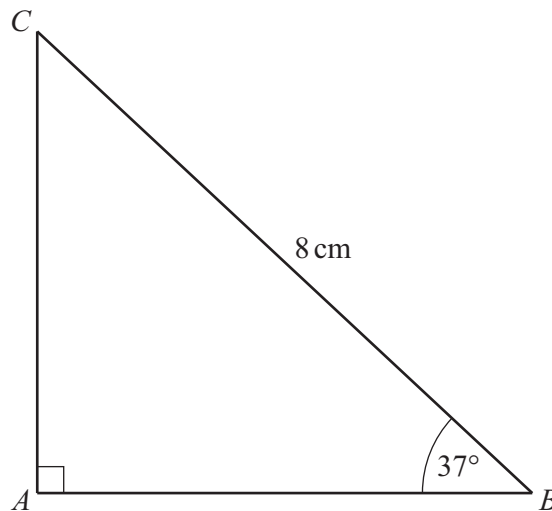
..... km [2]

8 **Without using a calculator**, work out $\frac{3}{7} - \frac{1}{14}$.

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

..... [2]

9



NOT TO
SCALE

The diagram shows a right-angled triangle.

Calculate AB .

$AB =$ cm [2]

10 Find the gradient of the line joining the points $(-2, 7)$ and $(3, 1)$.

\mathcal{R}

..... [2]

11 Solve the simultaneous equations.

\mathcal{R}

$$5t - 2w = 19$$

$$3t + 2w = 5$$

$$t = \text{.....}$$

$$w = \text{.....} [2]$$

12 Simplify.

\mathcal{R}

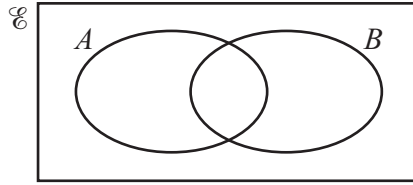
(a) $\frac{32g^{16}}{16g^8}$

..... [2]

(b) $(625k^8)^{\frac{3}{4}}$

..... [2]

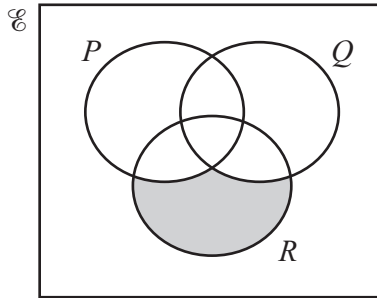
13 (a)



Shade the region $A \cup B'$.

[1]

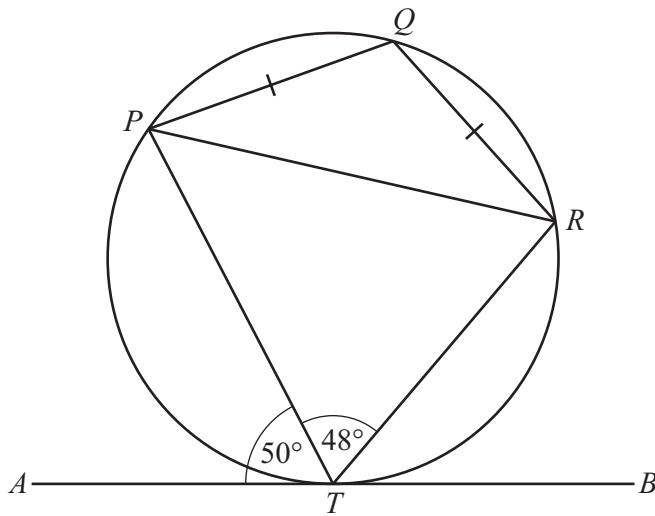
(b)



Use set notation to describe the shaded region.

..... [1]

14



NOT TO SCALE

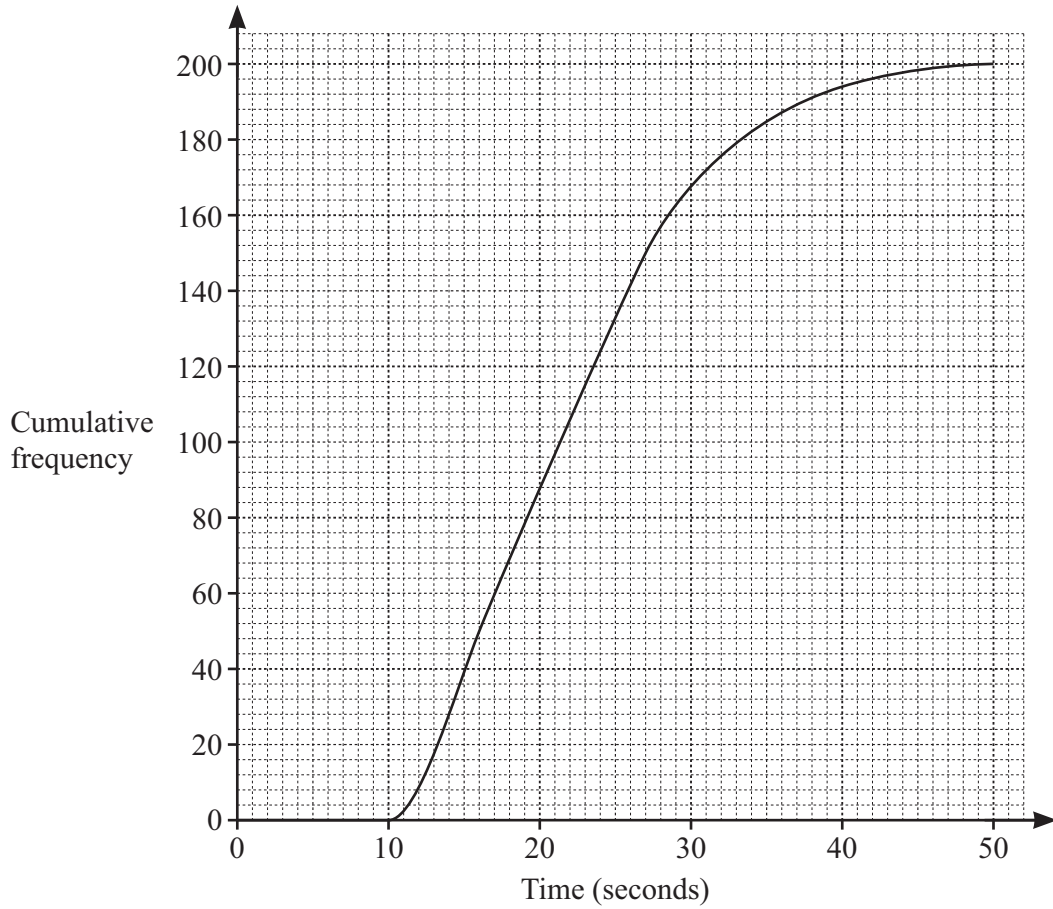
P, Q, R and T are points on the circle.
 AB is a tangent to the circle at T .
 Angle $ATP = 50^\circ$, angle $PTR = 48^\circ$ and $PQ = QR$.

(a) Find angle PRT .

Angle $PRT = \dots\dots\dots$ [1]

(b) Find angle QPR .

Angle $QPR = \dots\dots\dots$ [2]



The time taken for each of 200 students to complete a calculation is measured. The cumulative frequency diagram shows the results.

Use the diagram to find an estimate for

(a) the interquartile range

..... s [2]

(b) the number of students taking more than 40 seconds to complete the calculation.

..... [2]

16

$$A = \pi r^2 + \pi dh$$



Rearrange the formula to make h the subject.

$$h = \dots\dots\dots [2]$$

17 Work out, giving each answer in standard form.



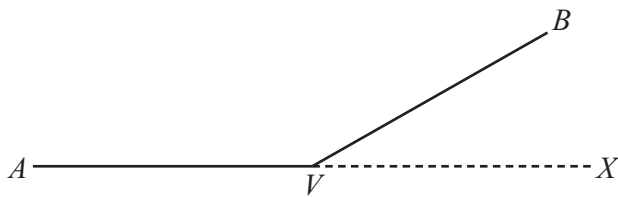
(a) $(2.1 \times 10^{101}) \times (8 \times 10^{101})$

$$\dots\dots\dots [2]$$

(b) $(2.1 \times 10^{101}) + (2.1 \times 10^{100})$

$$\dots\dots\dots [2]$$

18



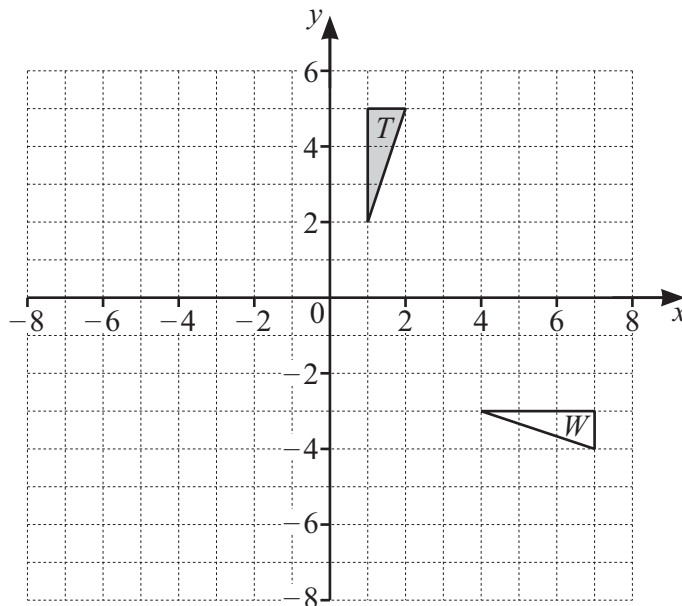
NOT TO SCALE

The diagram shows two sides, VA and VB , of a regular polygon.
 AVX is a straight line.
 Angle $BVX = y^\circ$ and angle $AVB = 11.5y^\circ$.

Find the number of sides of this polygon.

..... [3]

19



(a) Describe fully the **single** transformation that maps triangle T onto triangle W .

.....
 [3]

(b) Draw the enlargement of triangle T with scale factor -2 and centre of enlargement $(-1, 1)$. [2]

20 $f(x) = 3^x + 2$



(a) Find x when $f(x) = 245$.

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

(b) Find x when $f^{-1}(x) = 7$.

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

21 Write the recurring decimal $0.4\dot{1}$ as a fraction in its simplest form.



You must show all your working.

$\dots\dots\dots$ [2]

22 Solve the equation $\tan x + \sqrt{3} = 0$ for $0^\circ \leq x \leq 360^\circ$.



$\dots\dots\dots$ [3]

23 Simplify.

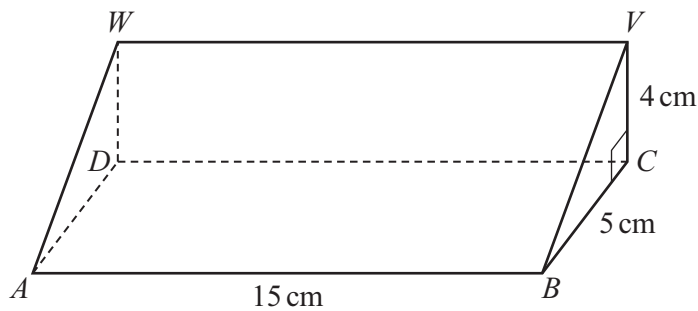


$$\frac{2}{y+1} - \frac{3}{y}$$

Give your answer as a single fraction in its simplest form.

..... [3]

24



NOT TO SCALE

The diagram shows a triangular prism with cross-section triangle BCV . Angle $BCV = 90^\circ$, $BC = 5$ cm, $CV = 4$ cm and $AB = 15$ cm.

Calculate the angle between AV and the base $ABCD$.

..... [4]

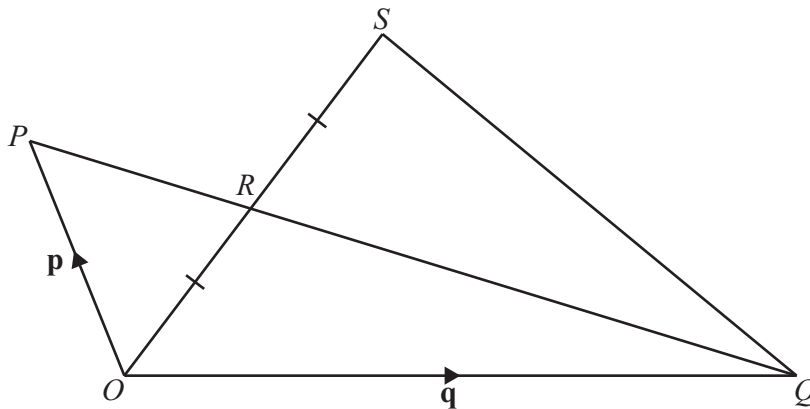
25 Simplify.



$$\frac{pt - p - t + 1}{1 - t^2}$$

..... [4]

26



NOT TO SCALE

In the diagram, O is the origin.

$\vec{OP} = \mathbf{p}$ and $\vec{OQ} = \mathbf{q}$.

R is the point of intersection of PQ and OS , with $PR : RQ = 1 : 2$ and $OR = RS$.

Find the position vector of S in terms of \mathbf{p} and \mathbf{q} .

Give your answer in its simplest form.

..... [4]