1 (K)

12	15	27	29	91	93

From the list of numbers, write down

(a) a cube number

..... [1]

(b) a prime number.

..... [1]

2 (K)

$\mathbf{v} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$ $\mathbf{y} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$

Find

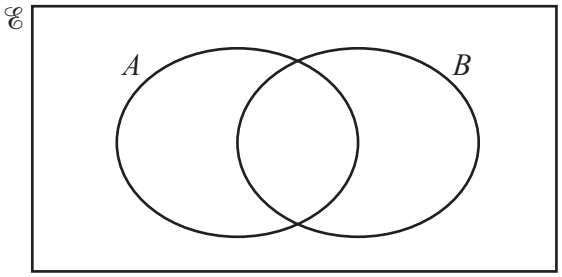
(a) $\mathbf{v} - \mathbf{y}$

( ) [1]

(b) $2\mathbf{v}$.

( ) [1]

3 (K)



On the Venn diagram, shade the region $A \cap B$. [1]

4 (K)

23, 17, 11, 5, ...

(a) Write down the next number in this sequence.

..... [1]

(b) Find the nth term of this sequence.

..... [2]

5 Factorise completely.

$8g - 2g^2$

..... [2]

6 **Without using a calculator**, work out $\frac{4}{7} \div 8$.

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

..... [2]

7 Solve.

(a) $15t + 8 = 4 - t$

$t =$ ..... [2]

(b) $\frac{25 - 2u}{3} = 2$

$u =$ ..... [2]

8 Calculate 0.3^2.
Give your answer in standard form.

..... [2]

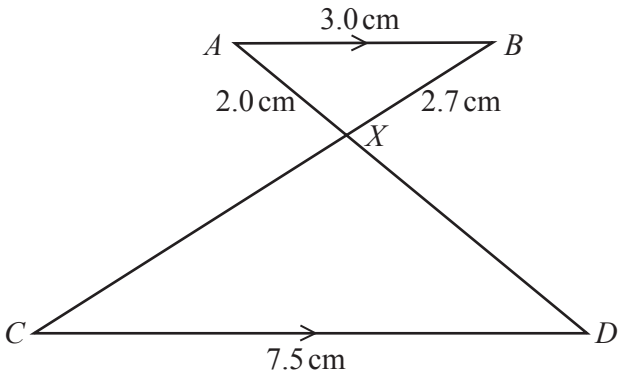
9 Solve the simultaneous equations.
You must show all your working.

$$3x - 2y = 19$$
$$x + y = 3$$

$x =$ .....

$y =$ ..... [3]

10



NOT TO SCALE

In the diagram, AB and CD are parallel.
The lines CB and AD intersect at X.
$AB = 3.0$ cm, $AX = 2.0$ cm, $BX = 2.7$ cm and $CD = 7.5$ cm.

Find the length of BC.

$BC =$ ..... cm [3]

11 Find the highest common factor (HCF) of $12x^{12}$ and $16x^{16}$.

K

..... [2]

12 In a regular polygon, the interior angle and the exterior angle are in the ratio interior : exterior = 11 : 1.

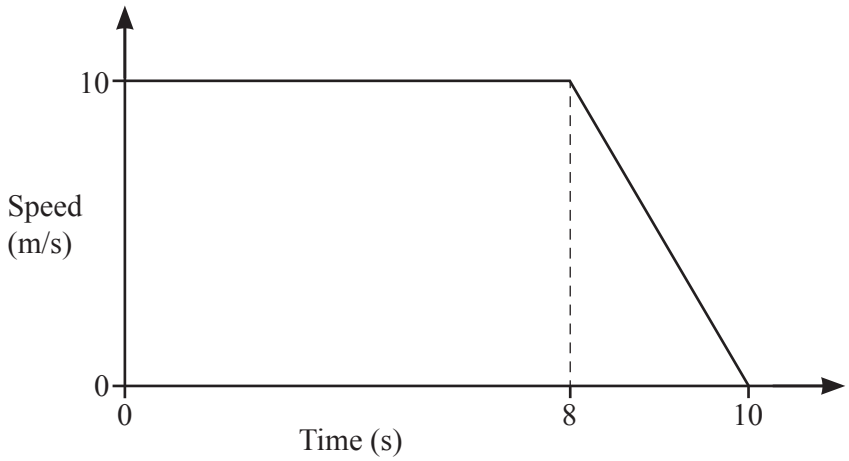
K

Find the number of sides of this regular polygon.

..... [3]

13

K



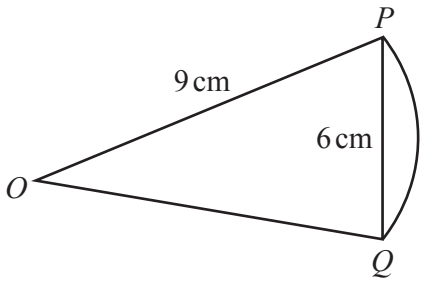
NOT TO SCALE

The diagram shows the speed–time graph for part of a car journey.

Calculate the total distance travelled during the 10 seconds.

..... m [2]

14



NOT TO SCALE

The diagram shows a sector of a circle with centre O and radius 9 cm.
The length of the chord PQ is 6 cm.

Calculate the length of the arc PQ.

..... cm [3]

15 Simplify $\left(3125w^{3125}\right)^{\frac{1}{5}}$.

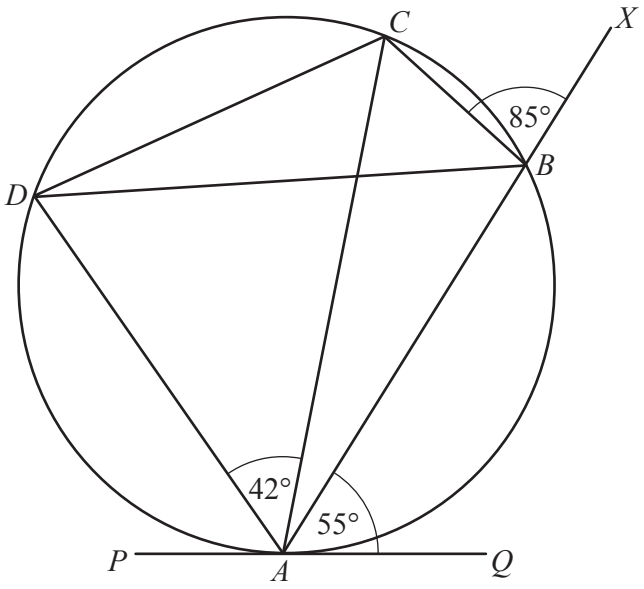
..... [2]

16 y is inversely proportional to x^2.
When $x = 3$, $y = 2$.

Find y when $x = 2$.

$y =$ ..... [3]

17



NOT TO SCALE

ABCD is a cyclic quadrilateral, *ABX* is a straight line and *PQ* is a tangent to the circle at *A*.
Angle *CBX* = 85°, angle *BAQ* = 55° and angle *CAD* = 42°.

Find

(a) angle *CBD*

Angle *CBD* = ... [1]

(b) angle *ACB*

Angle *ACB* = ... [1]

(c) angle *ADC*

Angle *ADC* = ... [1]

(d) angle *BCD*

Angle *BCD* = ... [2]

(e) angle *PAD*.

Angle *PAD* = ... [1]

18 Two solids are mathematically similar and have volumes $81\,\text{cm}^3$ and $24\,\text{cm}^3$.
The surface area of the smaller solid is $44\,\text{cm}^2$.

Calculate the surface area of the larger solid.

..... cm^2 [3]

19 Find the values of x when $6x + y = 10$ and $y = x^2 - 3x + 10$.

$x =$ ..... or $x =$ ..... [3]

20 Find the nth term of each sequence.

(a) –1, 0, 7, 26, 63, …

..... [2]

(b) 24, 12, 6, 3, 1.5, …

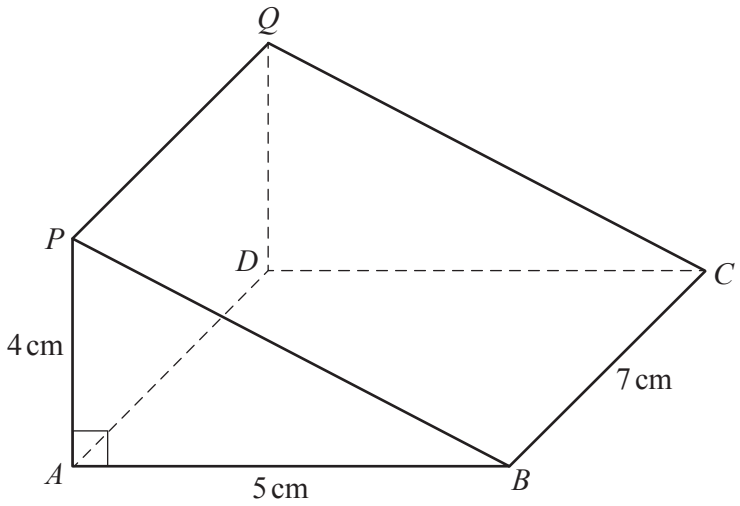
..... [2]

21 A car travels 14 km, correct to the nearest kilometre.
This takes 12 minutes, correct to the nearest minute.

Calculate the lower bound of the speed of the car.
Give your answer in kilometres per minute.

..... km/min [3]

22



NOT TO SCALE

The diagram shows a triangular prism $ABCDQP$ of length 7 cm.
The cross-section is triangle PAB with $PA = 4$ cm, $AB = 5$ cm and angle $PAB = 90°$.

Calculate the angle between the line PC and the base $ABCD$.

..... [4]

23 Simplify.

$$\frac{5x^2 - 19x + 12}{x^2 - 9}$$

..... [4]

24 The probability of Jamie hitting a target is $\frac{1}{3}$.

The probability that he hits the target for the first time on his nth attempt is $\frac{64}{2187}$.

Find the value of n.

$n =$ ..... [2]

25 $f(x) = x^3 + 1$

Find $f^{-1}(x)$.

$f^{-1}(x) =$ ..... [2]