Calculators must **not** be used in this paper.

1 **(a)** Write down the number of lines of symmetry of a kite.

..... [1]

(b) Write down the order of rotational symmetry of a parallelogram.

..... [1]

2 Work out.

(a) $-8 \times 2 + 3$

..... [1]

(b) 0.03×0.05

..... [1]

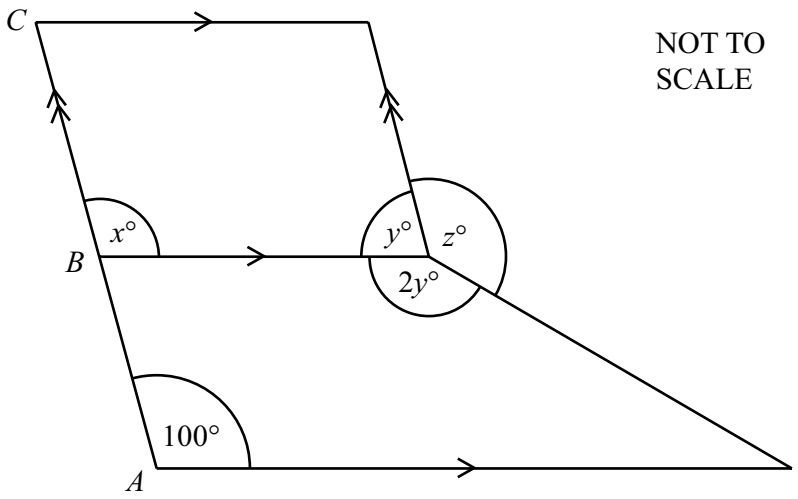
3 Here is some information about five positive integers.

- The median is 7.
- The mode is 13.
- The range is 10.
- They add up to 40.

Find the five integers.

..... , ... , ... , ... , ... [3]

4



The diagram shows a parallelogram and a trapezium.
The parallelogram and the trapezium are joined along a common side.
ABC is a straight line.

(a) Find the value of x.
Give a geometrical reason for your answer.

x = ... because .....

..... [2]

(b) Find the value of y.
Give a geometrical reason for your answer.

y = ... because .....

..... [2]

(c) Find the value of z.

z = ... [2]

5 **(a)** Convert 600 g into kg.

..... kg [1]

(b) Convert 5.7 litres into cm^3.

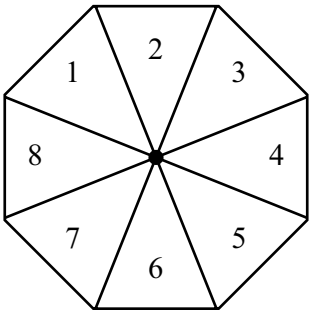
..... cm^3 [1]

6 Write these numbers in order, starting with the smallest.

$\frac{3}{20}$ 0.143 $\frac{1}{6}$ 16%

..... , ... , ... , ... [2]
smallest

7 Jude has a fair 8-sided spinner numbered 1 to 8.



Jude spins the spinner once.

Find the probability that the spinner lands on

(a) a number greater than 6

..... [1]

(b) an odd number or a multiple of 3.

..... [1]

8 Write the ratio 80 : 200 : 360 in its simplest form.

..... : ..... : ..... [2]

9 The time that Rafiq works is divided into meetings, planning and working on a computer.

One day, Rafiq is

- in meetings for $\frac{3}{4}$ of the time
- planning for $\frac{1}{5}$ of the time
- working on a computer for the remaining 25 minutes of the time.

Work out the total time that Rafiq works this day.
Give your answer in hours and minutes.

..... hours ..... minutes [5]

10 These are the first five terms of a sequence.

9 13 17 21 25

(a) Find an expression for the nth term of this sequence.

..... [2]

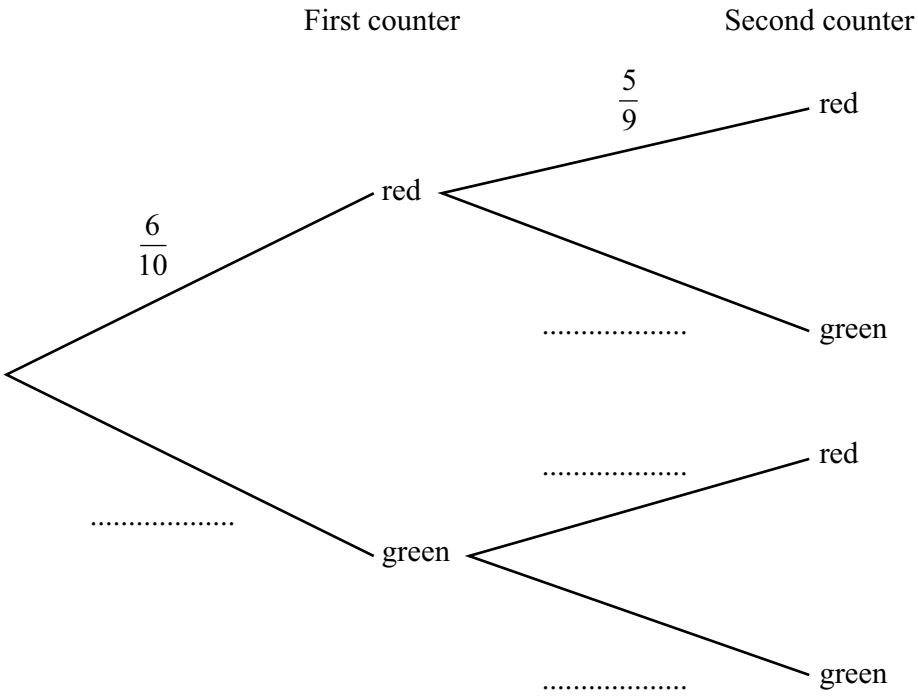
(b) The kth term of this sequence is 89.

Find the value of k.

$k =$ ..... [2]

11 Asha has a bag containing 6 red counters and 4 green counters.
She takes two counters from the bag at random without replacement.

(a) Complete the tree diagram.



[2]

(b) Work out the probability that Asha takes two green counters.

..... [2]

12 **(a)** Expand.

$$2x(3x^2 - 8x)$$

..... [2]

(b) **(i)** Factorise.

$$x^2 - 19^2$$

..... [1]

(ii) Work out.

$$81^2 - 19^2$$

..... [2]

13 A force of 196 newtons is applied to a square surface of side 4.9 cm.

By writing each number correct to 1 significant figure, work out an estimate of the pressure applied to the square surface.

[Pressure = force ÷ area]
[Pressure is measured in newtons / cm^2]

..... newtons / cm^2 [3]

14 Freya records how many minutes she takes to complete a crossword each day.

On Tuesday, she takes 10% less time than on Monday.
On Wednesday, she takes 50% less time than on Tuesday.
On Wednesday, she takes 9 minutes to complete the crossword.

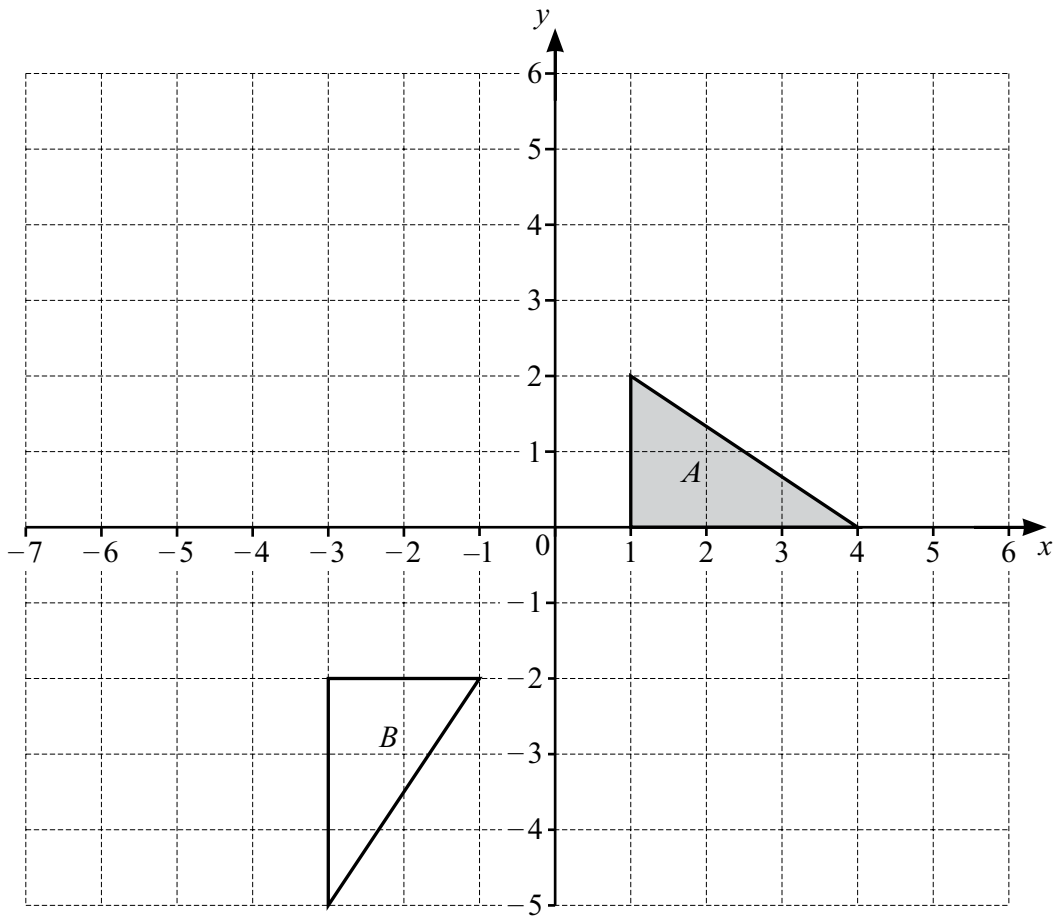
Find the number of minutes Freya takes to complete the crossword on Monday.

..... minutes [3]

15 Write $0.3\dot{1}\dot{2}$ as a fraction.
Give your answer in its simplest form.

..... [3]

16



(a) On the grid, draw the image of

(i) triangle A after a reflection in the line $y = x + 2$ [3]

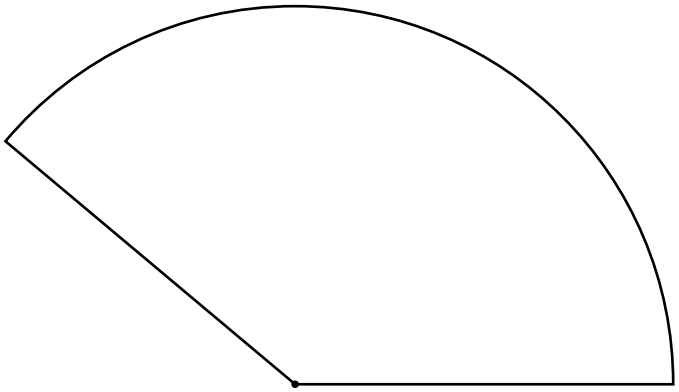
(ii) triangle A after an enlargement by scale factor $\frac{3}{2}$ with centre (1, 0). [2]

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

.....

..... [3]

17



NOT TO SCALE

The diagram shows a sector of a circle with radius 6 cm.
The area of the sector is 15π cm^2.

(a) Work out the perimeter of the sector.
Give your answer in the form $a + b\pi$, where a and b are integers.

..... cm [4]

(b) The sector is the cross-section of a prism of length 10 cm.

Work out, giving your answer in terms of π,

(i) the volume of the prism

..... cm^3 [1]

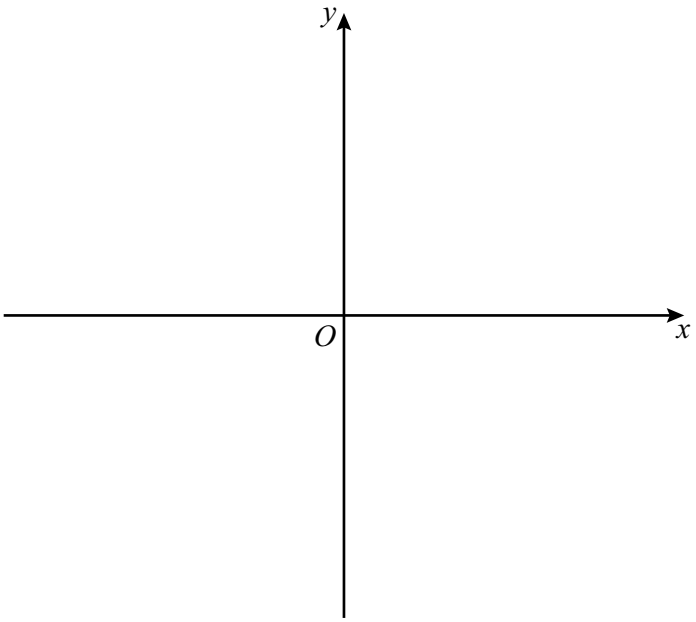
(ii) the total surface area of the prism.

..... cm^2 [3]

18 **(a)** Write $x^2 - 8x + 10$ in the form $(x - p)^2 - q$.

..... [2]

(b) Sketch the graph of $y = x^2 - 8x + 10$.
On the sketch, label the coordinates of the turning point and the y-intercept.



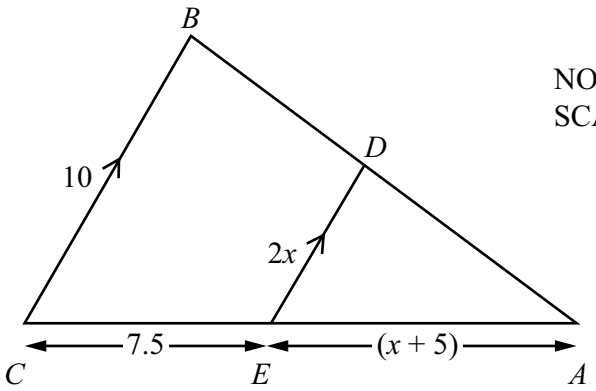
[3]

19 Rationalise the denominator and simplify.

$$\frac{8}{1 - \sqrt{5}}$$

..... [3]

20 In this question all lengths are given in centimetres.



Triangle ABC is mathematically similar to triangle ADE.

(a) (i) Show that $2x^2 + 15x - 50 = 0$.

[3]

(ii) Solve by factorising $2x^2 + 15x - 50 = 0$.

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

(iii) Find the length AC.

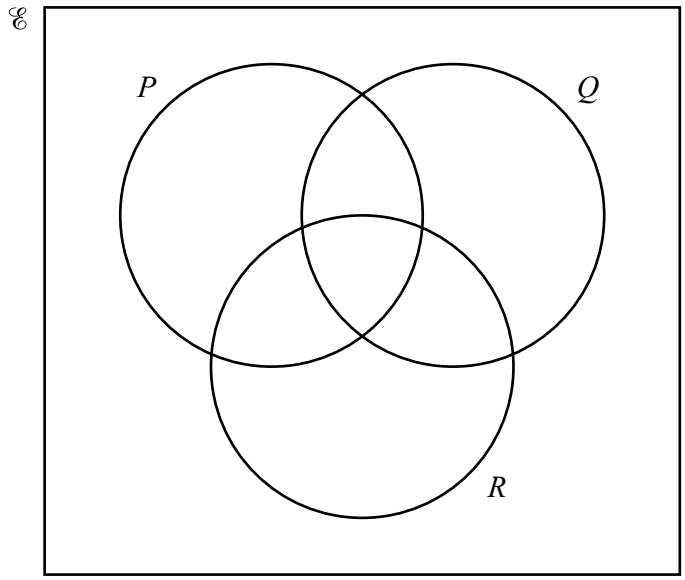
AC = ... cm [1]

(b) The area of triangle ABC is $k\,\text{cm}^2$.

Find an expression for the area of the quadrilateral $BCED$.
Give your answer in terms of k.

..... cm^2 [2]

21



In the Venn diagram, shade the region $P \cup Q' \cup R'$. [1]

22 Expand and simplify.

$$(2x - 3)(x + 1)(2 - 3x)$$

..... [3]

23 Rearrange the formula to make p the subject.

$$d = \frac{2p + 3}{2 - py}$$

$p =$ ..... [4]

24 **(a)** Simplify.

(i) $(2xy)^0$

..... [1]

(ii) $\left(\frac{81m^8}{3m^2}\right)^{\frac{2}{3}}$

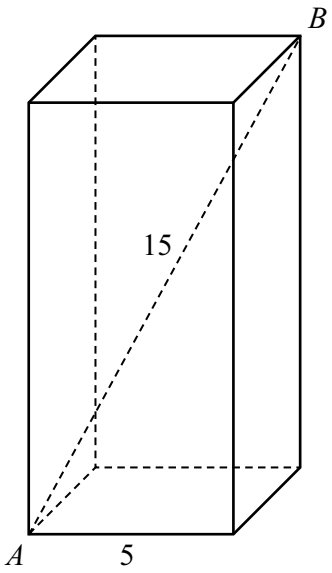
..... [3]

(b) Find the value of x.

$$32^x \times 2^{x+3} = \frac{1}{4}$$

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

25



NOT TO SCALE

The diagram shows a cuboid with a square base.
The length of the edge of the base is 5 cm.
The length of the diagonal AB is 15 cm.

Work out the height of the cuboid.
Give your answer as a surd in its simplest form.

..... cm [4]