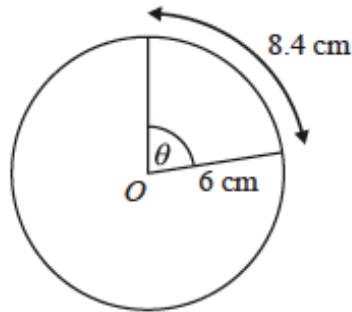


Revision F4 (All topics) C [38]

1.

- (a) A circle has a radius of 6 cm.
A sector has an arc length of 8.4 cm.
The angle at the centre of the sector is θ .

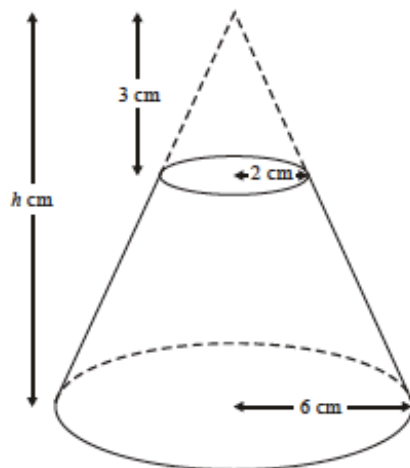


Not drawn accurately

Calculate the value of θ .

(3)

- (b) A cone has base radius 6 cm and height h cm.
A smaller cone of base radius 2 cm and height 3 cm is cut from the top.
The remaining frustum has dimensions as shown.



Not drawn accurately

Calculate the volume of the frustum.

(5)

(Total 8 marks)

2.

The volume, v litres, which a fixed mass of gas occupies, is inversely proportional to its pressure, p pascals.

When the pressure is 150 000 pascals, its volume is 5 litres.

- (a) Find an equation connecting v and p .
- (b) Find the volume of the gas when the pressure is 250 000 pascals.
- (c) Find the pressure of the gas when its volume is 300 litres.

(3)

(1)

(2)

(Total 6 marks)

3.

All the pupils at a stage school audition for parts in a musical.

If a pupil is male then the probability of getting a part is $\frac{4}{5}$

If a pupil is female then the probability of getting a part is $\frac{3}{10}$

The probability that a pupil is male is $\frac{1}{3}$

(a) Calculate the probability that a pupil chosen at random gets a part in the musical.

(3)

(b) 77 pupils get parts in the musical.

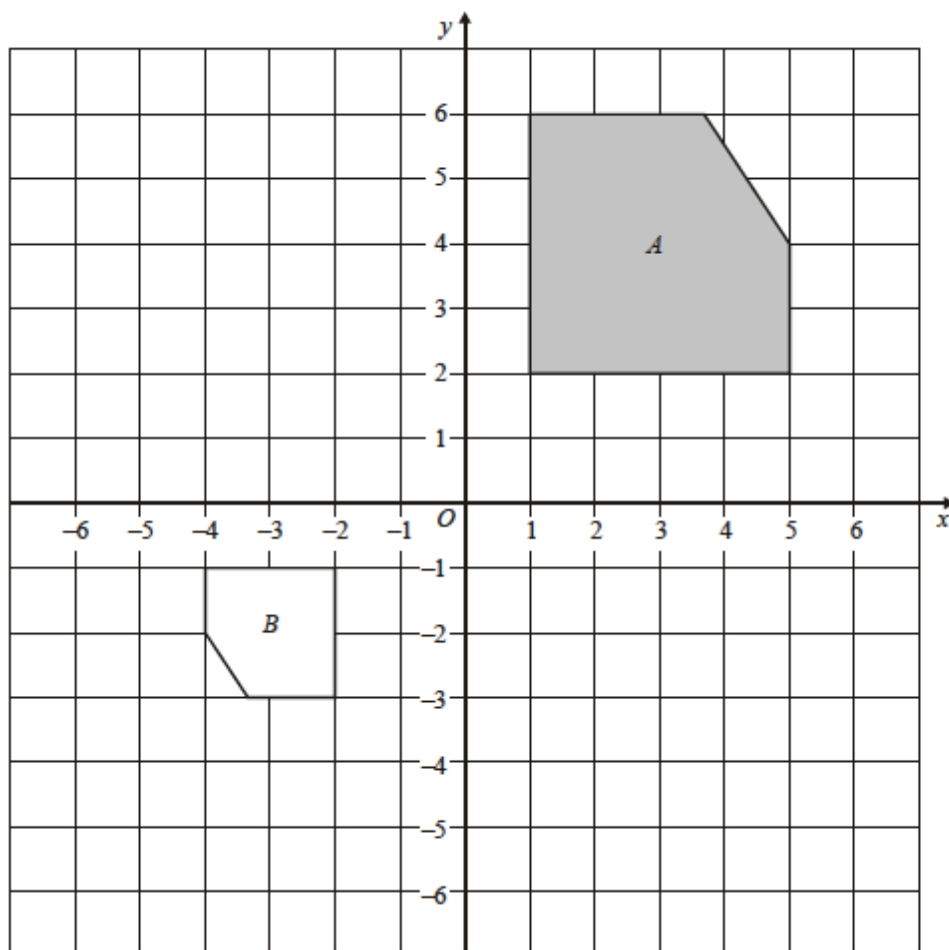
How many pupils are there in the school?

(2)

(Total 5 marks)

4.

In the diagram, shape *B* is an enlargement of the shaded shape *A*.



(a) Write down the coordinates of the centre of enlargement.

(1)

(b) Write down the scale factor of the enlargement.

(1)

(Total 2 marks)

5.

On Friday, Greg takes part in a long jump competition.

He has to jump at least 7.5 metres to qualify for the final on Saturday.

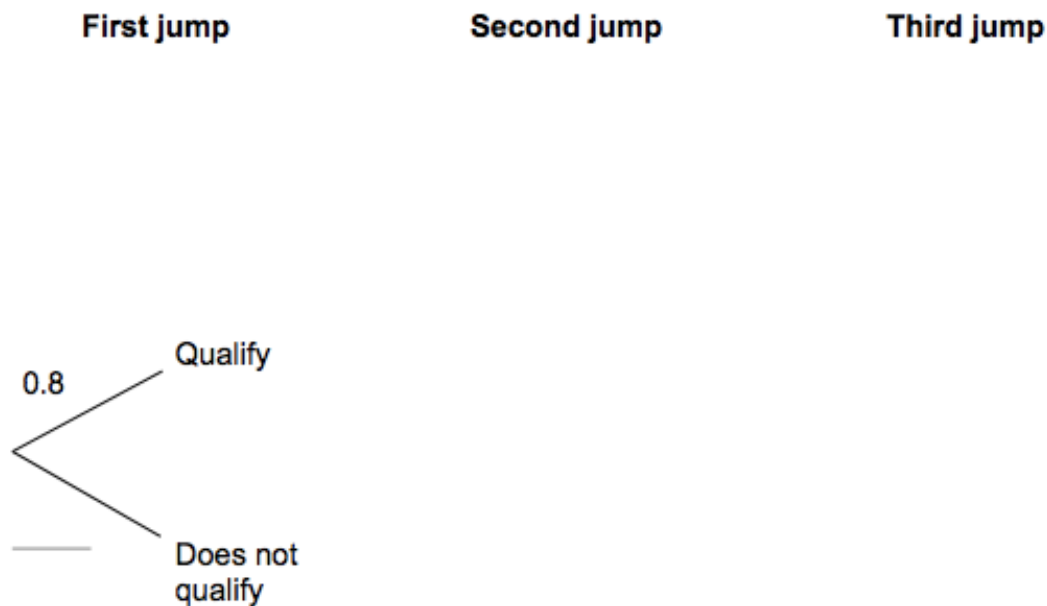
- He has up to three jumps to qualify.
- If he jumps at least 7.5 metres he does **not** jump again on Friday.

Each time Greg jumps, the probability he jumps at least 7.5 metres is 0.8

Assume each jump is independent.

(a) Complete the tree diagram.

[2 marks]



(b) Work out the probability that he does **not** need the third jump to qualify.

[2 marks]

6.

(a) Factorise $m^2 - 49$

(1)

(b) Solve these simultaneous equations

$$\begin{aligned}5x + 3y &= 6 \\3x - 7y &= 19\end{aligned}$$

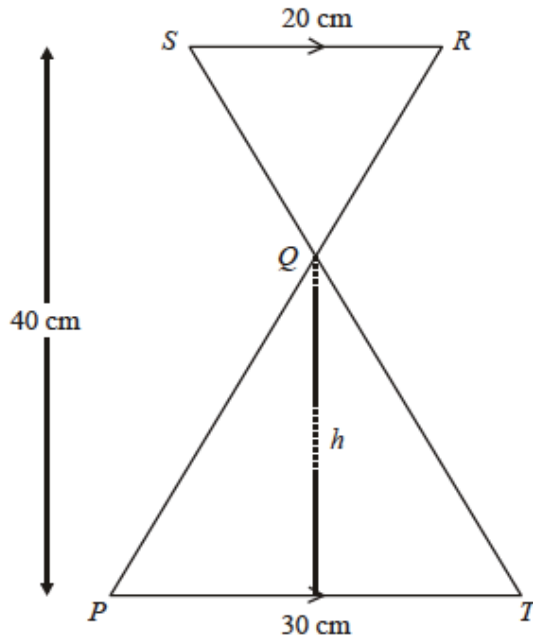
You **must** show your working. Do **not** use trial and improvement.

(4)
(Total 5 marks)

7.

In the diagram SR is parallel to PT .
 SQT and RQP are straight lines.
 $SR = 20$ cm and $PT = 30$ cm
 The total height of the two triangles is 40 cm.

Not drawn accurately

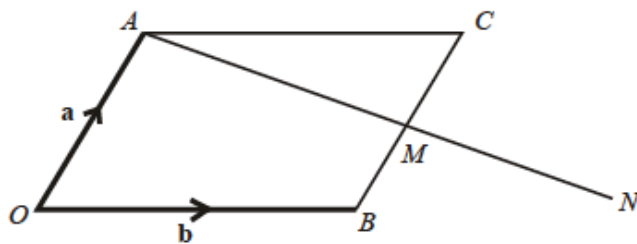


Use similar triangles to calculate the height, h cm, of triangle PQT .

(Total 3 marks)

8.

$OACB$ is a parallelogram and M is the mid-point of BC .
 $\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$



Not drawn accurately

(a) Express the following vectors in terms of \mathbf{a} and \mathbf{b}

(i) \vec{BA} (1)

(ii) \vec{AM} (1)

(b) AM is extended to N , where $\vec{AN} = 2\vec{AM}$.

Show that $\vec{BN} = \mathbf{b}$ (2)

(c) What does this tell you about the position of N ? (1)

(Total 5 marks)