2021 ASSESSMENT MATERIALS

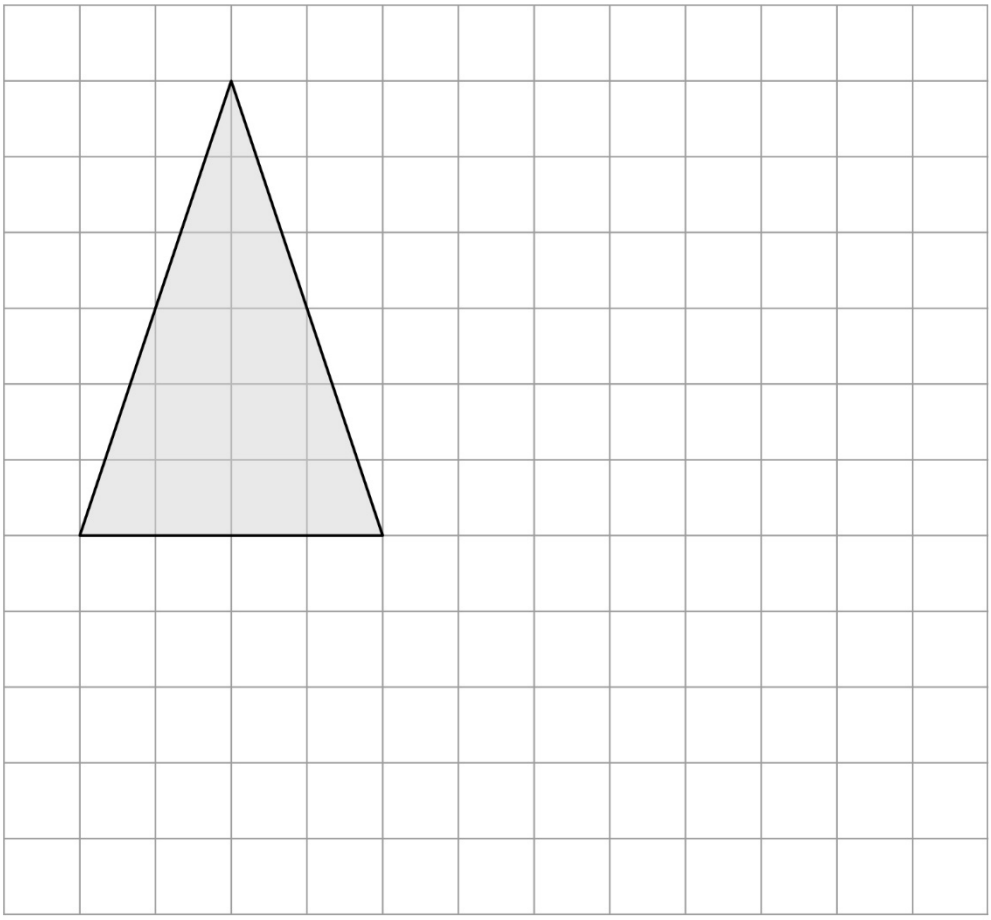
GCSE
MATHEMATICS (8300)
HIGHER

Geometry

Total number of marks: 39 per optional item

Q5

On the grid, draw an enlargement of the triangle with scale factor $\frac{1}{2}$



(Total 2 marks)

Q2

The vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ translates A to B.

Circle the vector that translates B to A.

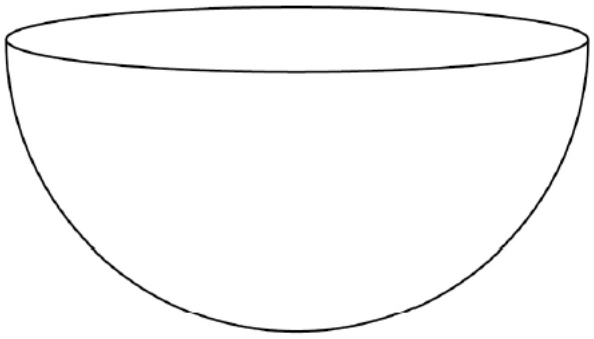
$\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$ $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$

(Total 1 mark)

Q10

Volume of a sphere = $\frac{4}{3}\pi r^3$ where r is the radius

A container is a hemisphere of radius 30 cm



Sand fills the container at a rate of 4000 cm^3 per minute.

Does it take **less than** a quarter of an hour to fill the container?

You **must** show your working.

(Total 3 marks)

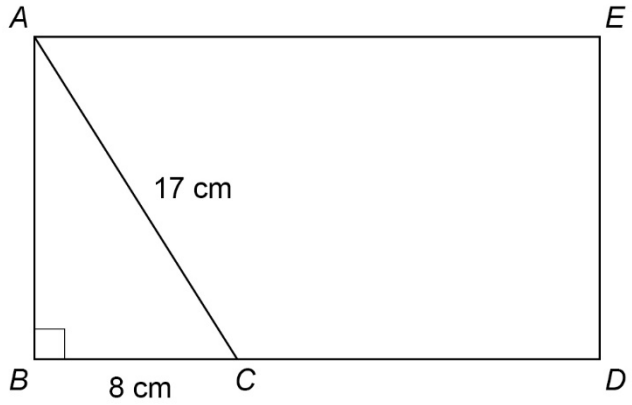
Q7

The diagram shows rectangle *ABDE* and right-angled triangle *ABC*.

AC = 17 cm

BC = 8 cm

Not drawn accurately



BC : *CD* = 1 : 2

Work out the area of rectangle *ABDE*.

Answer _____ cm^2

(Total 4 marks)

Q5

Using ruler and compasses, show the region inside the grid that is

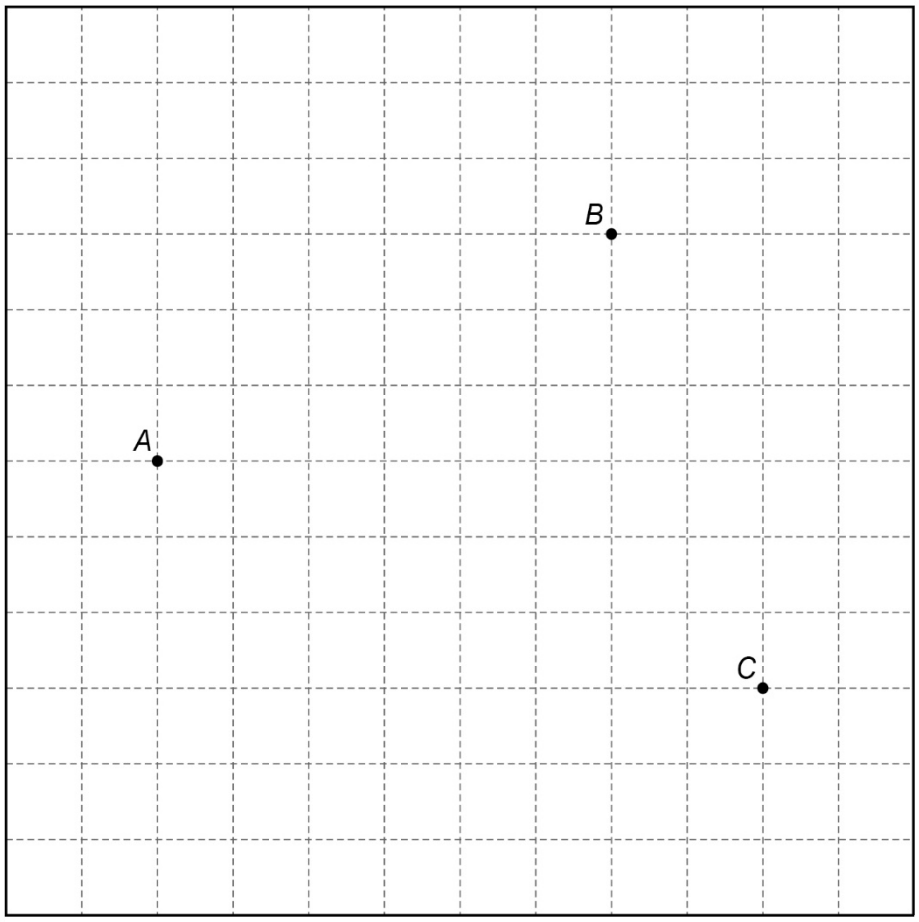
less than 4 cm from *A*

and

nearer to *B* than to *C*.

Label the region R.

Show all your construction lines.

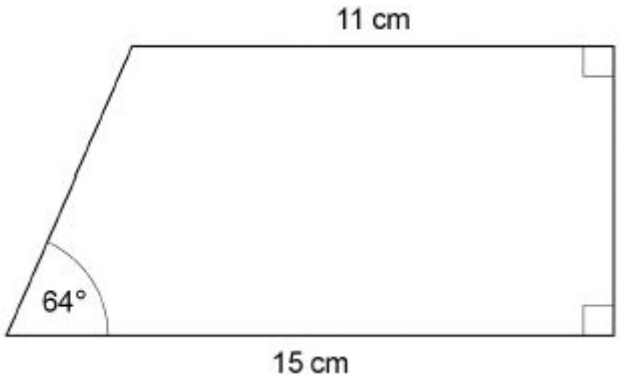


(Total 3 marks)

Q19

Work out the area of the trapezium.

Not drawn accurately



Answer _____ cm^2

(Total 4 marks)

Q3

Work out the arc length, in metres, of a semicircle of radius 6 metres.

Circle your answer.

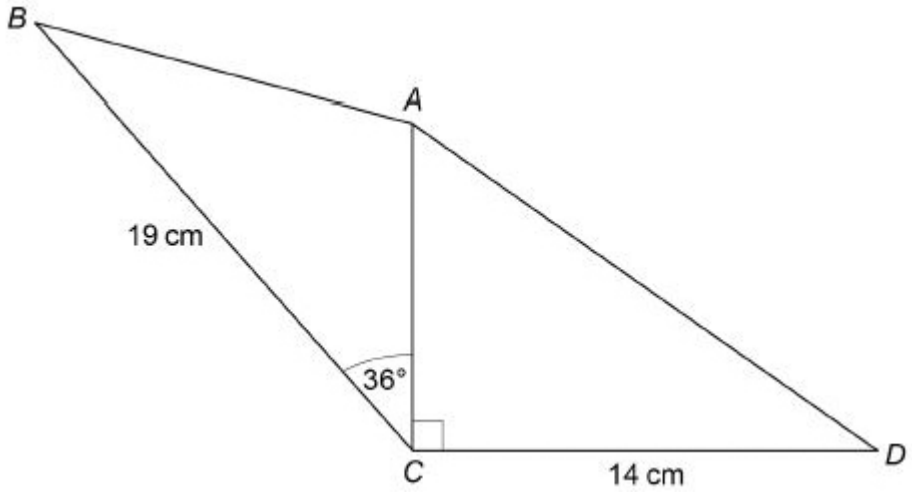
3π 6π 12π 18π

(Total 1 mark)

Q16

ABC and *ACD* are triangles.

Not drawn accurately



The area of *ACD* is 80.5 cm^2

Work out the area of *ABC*.

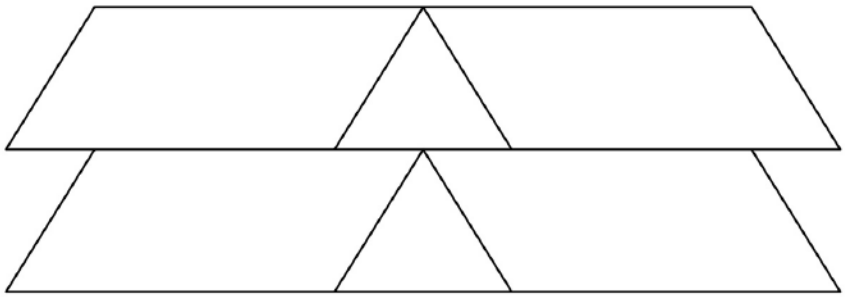
Give your answer to 3 significant figures.

Answer _____ cm^2

(Total 4 marks)

Q8a

This shape is made from two triangles and four congruent parallelograms.



Not drawn accurately

Tick the correct box.

The triangles are equilateral.

☐ Must be true

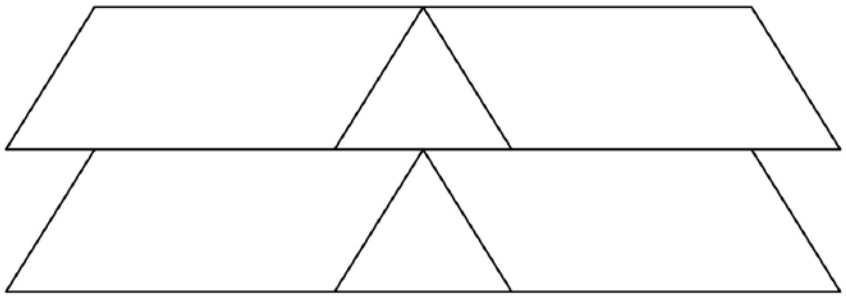
☐ Could be true

☐ Must be false

(Total 1 mark)

Q8b

This shape is made from two triangles and four congruent parallelograms.



Not drawn accurately

Tick the correct box.

The triangles are congruent.

☐ Must be true

☐ Could be true

☐ Must be false

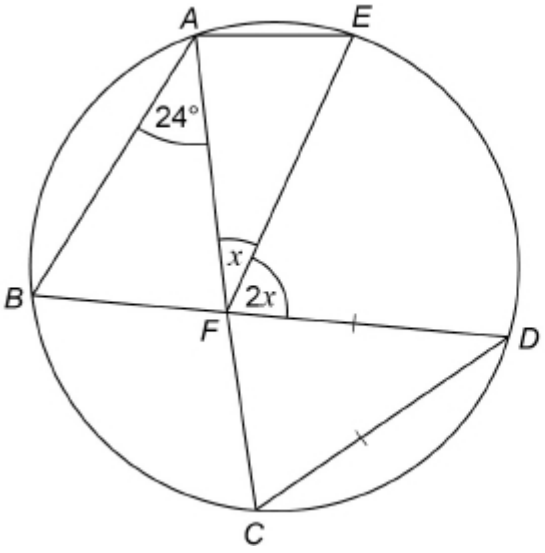
(Total 1 mark)

Q19

A, *B*, *C*, *D* and *E* are points on a circle.

BFD and *AFC* are straight lines.

DC = *DF*



Not drawn accurately

Work out the size of angle x.

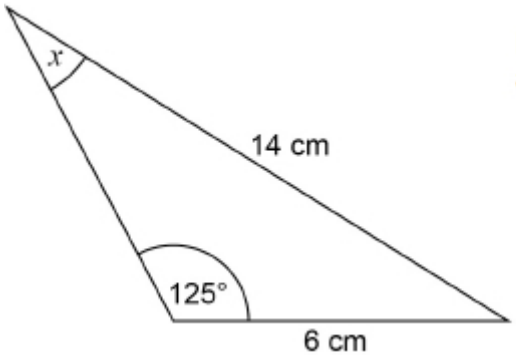
You **must** show your working which may be on the diagram.

Answer _____ degrees

(Total 4 marks)

Q20

Work out the size of angle x.



Not drawn accurately

Answer _____ degrees

(Total 3 marks)

Q7

The sum of the angles in any quadrilateral is 360°

For example, in a rectangle 4 × 90° = 360°

Zak writes,

5 × 90° = 450° so the sum of the angles in any pentagon must be 450°

Is he correct?

Tick a box.

☐ Yes ☐ No

Show working to support your answer.

(Total 2 marks)

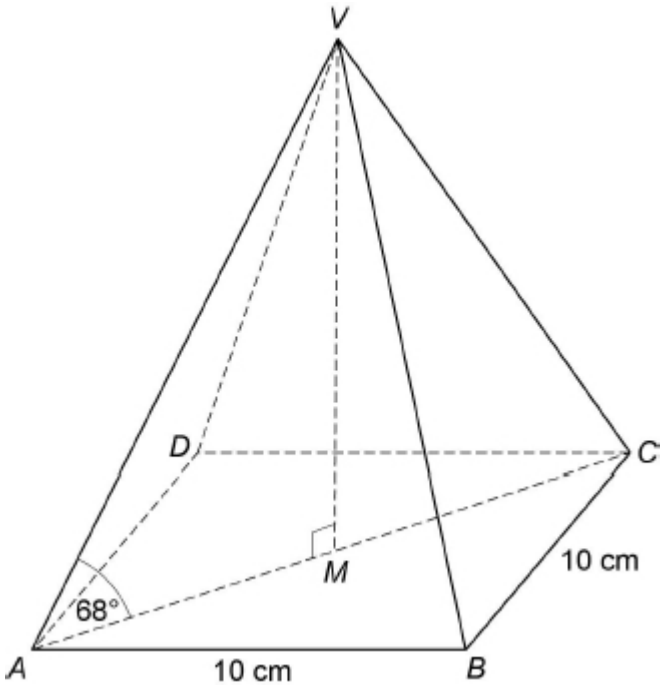
Q27

VABCD is a square-based pyramid.

The horizontal base *ABCD* has side length 10 cm and centre *M*.

Angle *VMA* is 90°

Angle *VAM* is 68°



Volume of pyramid = $\frac{1}{3}$ × area of base × perpendicular height

Work out the volume of the pyramid.

Answer _____ cm^3

(Total 6 marks)