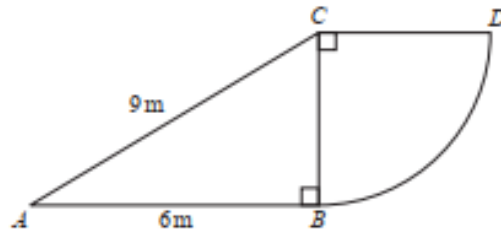


SECTOR AREAS AND ARC LENGTH

Pearson Edexcel – Thursday 4 June 2020 - Paper 2 (Calculator) Higher Tier

1.

7 The diagram shows a right-angled triangle and a quarter circle.



The right-angled triangle ABC has angle $ABC = 90^\circ$
The quarter circle has centre C and radius CB .

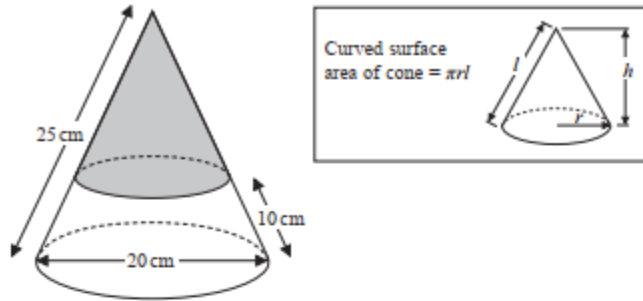
Work out the area of the quarter circle.
Give your answer correct to 3 significant figures.
You must show all your working.

..... m^2

(Total for Question 7 is 4 marks)

2.

18 The diagram represents a solid cone.



The cone has a base diameter of 20 cm and a slant height of 25 cm.

A circle is drawn around the surface of the cone at a slant height of 10 cm above the base.
The curved surface of the cone above the circle is painted grey.

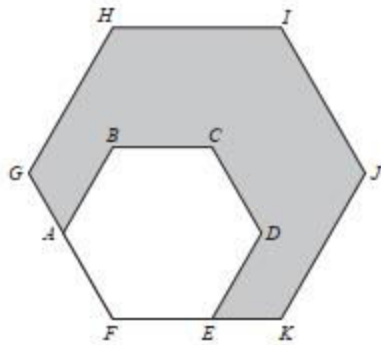
Work out the area of the curved surface of the cone that is **not** painted grey.
Give your answer as a multiple of π
You must show all your working.

..... cm²

(Total for Question 18 is 4 marks)

3.

19



$ABCDEF$ is a regular hexagon with sides of length x .

This hexagon is enlarged, centre F , by scale factor p to give hexagon $FGHIJK$.

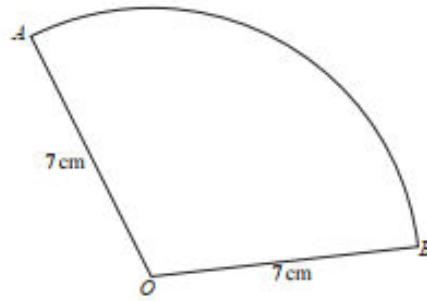
Show that the area of the shaded region in the diagram is given by $\frac{3\sqrt{3}}{2}(p^2 - 1)x^2$

(Total for Question 19 is 4 marks)

Pearson Edexcel - Thursday 6 June 2019 - Paper 2 (Calculator) Higher Tier

4.

12. OAB is a sector of a circle with centre O and radius 7 cm.



The area of the sector is 40 cm².

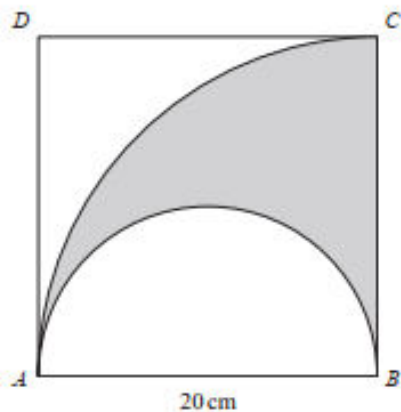
Calculate the perimeter of the sector.

Give your answer correct to 3 significant figures.

..... cm

(Total for Question 12 is 4 marks)

- 7 The diagram shows a square $ABCD$ with sides of length 20 cm. It also shows a semicircle and an arc of a circle.

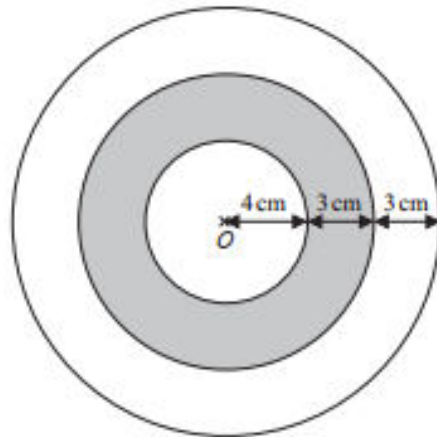


AB is the diameter of the semicircle.
 AC is an arc of a circle with centre B .

Show that $\frac{\text{area of shaded region}}{\text{area of square}} = \frac{\pi}{8}$

(Total for Question 7 is 4 marks)

- 4 The diagram shows a logo made from three circles.



Each circle has centre O .

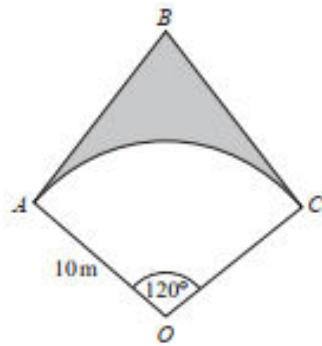
Daisy says that exactly $\frac{1}{3}$ of the logo is shaded.

Is Daisy correct?

You must show all your working.

(Total for Question 4 is 4 marks)

20



OAC is a sector of a circle, centre O , radius 10 m .

BA is the tangent to the circle at point A .

BC is the tangent to the circle at point C .

Angle $AOC = 120^\circ$

Calculate the area of the shaded region.

Give your answer correct to 3 significant figures.

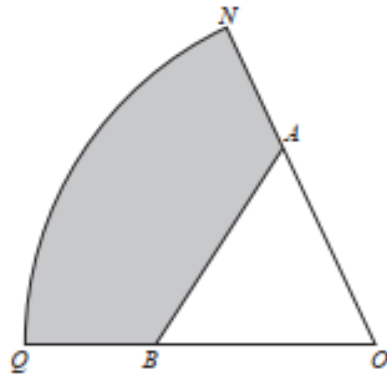
..... m^2

(Total for Question 20 is 5 marks)

Pearson Edexcel - Thursday 8 June 2017 - Paper 2 (Calculator) Higher Tier

8.

17



ONQ is a sector of a circle with centre O and radius 11 cm.

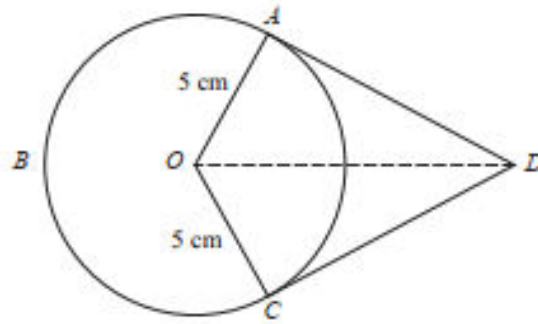
A is the point on ON and B is the point on OQ such that AOB is an equilateral triangle of side 7 cm.

Calculate the area of the shaded region as a percentage of the area of the sector ONQ .
Give your answer correct to 1 decimal place.

.....%

(Total for Question 17 is 5 marks)

18



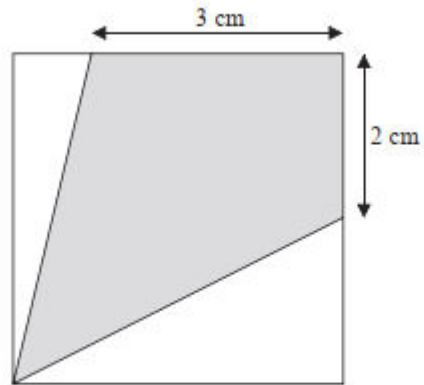
A , B and C are points on a circle of radius 5 cm , centre O .
 DA and DC are tangents to the circle.
 $DO = 9\text{ cm}$

Work out the length of arc ABC .
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 18 is 5 marks)

2 The diagram shows a square with perimeter 16 cm.



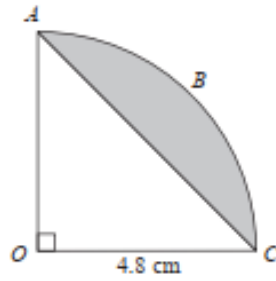
Work out the proportion of the area inside the square that is shaded.

(Total for Question 2 is 5 marks)

Pearson Edexcel - Specimen Papers Set 2 - Paper 2 (Calculator) Higher Tier

11.

7



The arc ABC is a quarter of a circle with centre O and radius 4.8 cm.
 AC is a chord of the circle.

Work out the area of the shaded segment.
Give your answer correct to 3 significant figures.

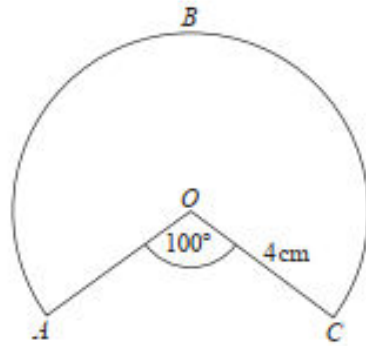
.....cm²

(Total for Question 7 is 3 marks)

Pearson Edexcel - Specimen Papers Set 2 - Paper 3 (Calculator) Higher Tier

12.

16 The diagram shows a sector of a circle of radius 4 cm.



Work out the length of the arc ABC .
Give your answer correct to 3 significant figures.

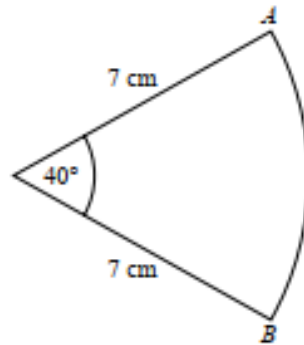
.....cm

(Total for Question 16 is 2 marks)

Pearson Edexcel - Sample Paper 2 - (Calculator) Higher Tier

13.

17 The diagram shows a sector of a circle of radius 7 cm.



Work out the length of arc AB .
Give your answer correct to 3 significant figures.

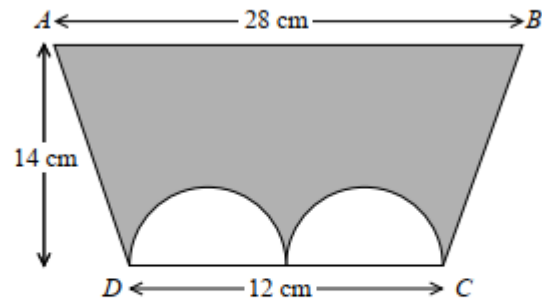
..... cm

(Total for Question 17 is 2 marks)

Pearson Edexcel - Sample Paper 3 - (Calculator) Higher Tier

14.

1 The diagram shows a trapezium $ABCD$ and two identical semicircles.



The centre of each semicircle is on DC .

Work out the area of the shaded region.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 1 is 4 marks)

12 The diagram shows a circle inside a square.

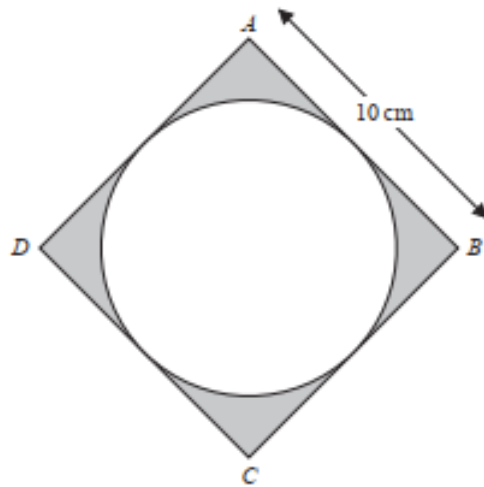


Diagram NOT
accurately drawn

$ABCD$ is a square of side 10 cm.
Each side of the square is a tangent to the circle.

Work out the total area of the shaded regions in terms of π .
Give your answer in its simplest form.

..... cm^2

(Total for Question 12 is 3 marks)

25 ABD is a right angled triangle.

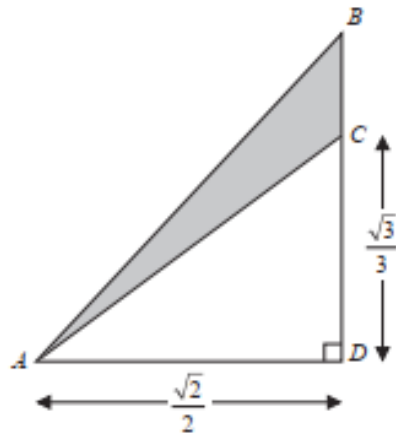


Diagram **NOT**
accurately drawn

All measurements are given in centimetres.

C is the point on BD such that $CD = \frac{\sqrt{3}}{3}$

$$AD = BD = \frac{\sqrt{2}}{2}$$

Work out the exact area, in cm^2 , of the shaded region.

..... cm^2

(Total for Question 25 is 3 marks)

18

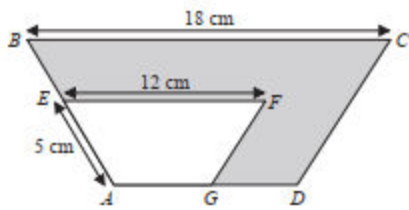


Diagram NOT accurately drawn

$ABCD$ and $AEFG$ are mathematically similar trapeziums.
 $AE = 5$ cm
 $EF = 12$ cm
 $BC = 18$ cm

(a) Work out the length of AB .

..... cm
(2)

Trapezium $AEFG$ has an area of 36 cm².

(b) Work out the area of the shaded region.

..... cm²
(3)

(Total for Question 18 is 5 marks)

19

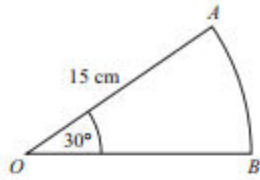


Diagram NOT
accurately drawn

OAB is a sector of a circle, centre O .
The radius of the circle is 15 cm.
The angle of the sector is 30° .

Calculate the area of sector OAB .
Give your answer correct to 3 significant figures.

..... cm²

(Total for Question 19 is 2 marks)

Pearson Edexcel - Tuesday 6 November 2012 - Paper 1 (Non-Calculator) Higher Tier

19.

12 The diagram shows a circle drawn inside a square.

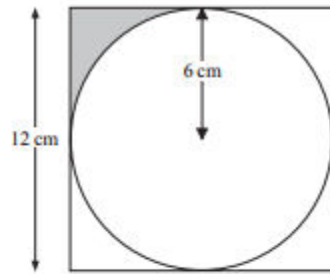


Diagram NOT accurately drawn

The circle has a radius of 6 cm.
The square has a side of length 12 cm.

Work out the shaded area.
Give your answer in terms of π .

.....cm²

(Total for Question 12 is 3 marks)

11.

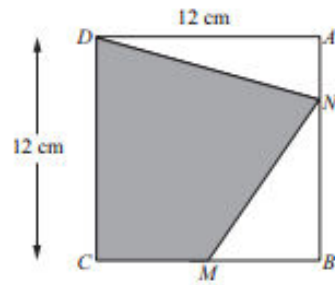


Diagram NOT
accurately drawn

$ABCD$ is a square of side 12 cm.
 M is the midpoint of CB .
 N is a point on AB .

$$AN = \frac{1}{4}AB.$$

Calculate the area of the shaded region $CDNM$.

..... cm^2

(Total 6 marks)

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

21.

23.

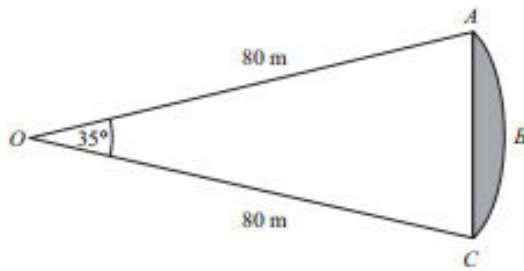


Diagram NOT
accurately drawn

ABC is an arc of a circle centre O with radius 80 m .
 AC is a chord of the circle.
Angle $AOC = 35^\circ$.

Calculate the area of the shaded region.
Give your answer correct to 3 significant figures.

..... m^2

(Total 5 marks)

5. The diagram shows a circular pond with a path around it.

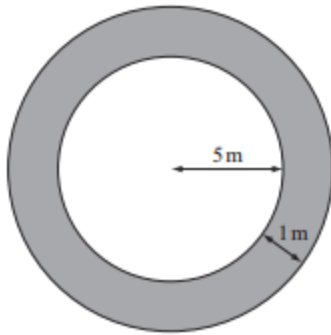


Diagram **NOT**
accurately drawn

The pond has a radius of 5 m.
The path has a width of 1 m.

Work out the area of the path.
Give your answer correct to 3 significant figures.

..... m²

(Total 3 marks)

26. The diagram shows a sector of a circle with centre O .
The radius of the circle is 8 cm.

PRS is an arc of the circle.
 PS is a chord of the circle.
Angle $POS = 40^\circ$

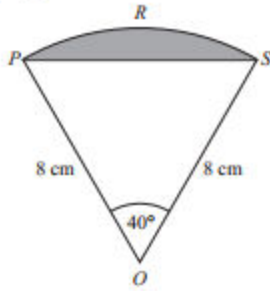


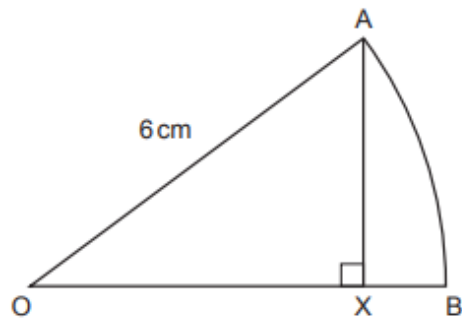
Diagram **NOT**
accurately drawn

Calculate the area of the shaded segment.
Give your answer correct to 3 significant figures.

..... cm²

(Total 5 marks)

- 15 OAB is a sector of a circle, centre O.
OA = 6 cm and AX is perpendicular to OB.



Not to scale

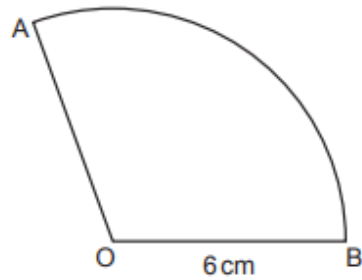
The area of sector OAB is $6\pi \text{ cm}^2$.

Show that $AX = 3\sqrt{3} \text{ cm}$.

[6]

25.

- 12 AOB is a sector of a circle, centre O and radius 6 cm.
The length of arc AB is 5π cm.



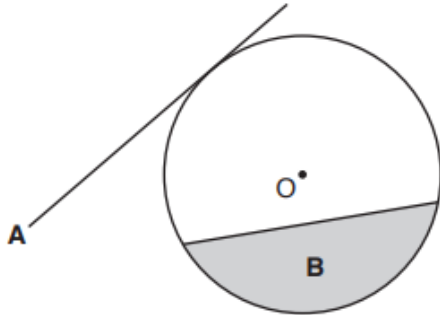
Not to scale

Find the area of the sector.
Give your answer in terms of π .

..... cm² [5]

26.

1 The diagram shows a circle, centre O.



Write down the mathematical name of

(a) line A,

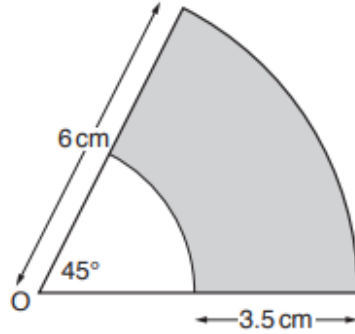
(a)[1]

(b) shaded region B.

(b)[1]

27.

- 8 The design below is made from two sectors of circles, centre O.

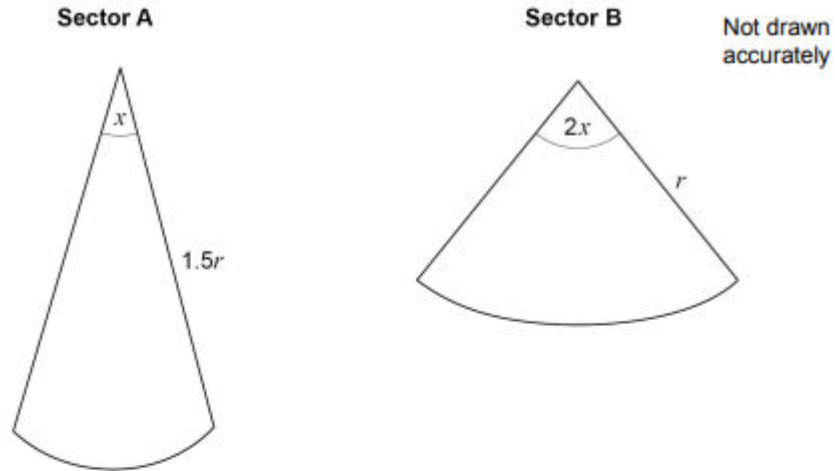


Calculate the perimeter of the shaded part.
Give your answer correct to 3 significant figures.

..... cm [5]

28.

16 Here are two sectors from different circles.



Which sector has the bigger area?

Tick a box.

Sector A

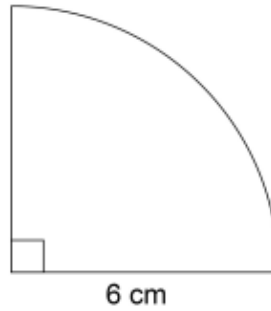
Sector B

Show working to support your answer.

[2 marks]

29.

7 Here is a quarter circle of radius 6 cm



Not drawn accurately

Work out the area of the quarter circle.

Give your answer in terms of π .

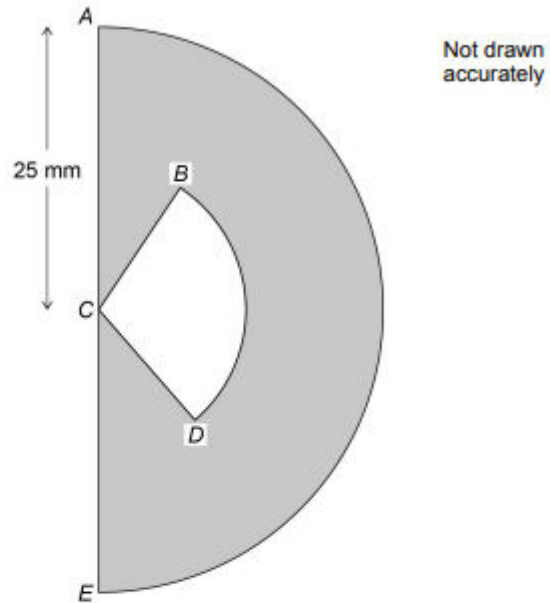
[2 marks]

Answer _____ cm^2

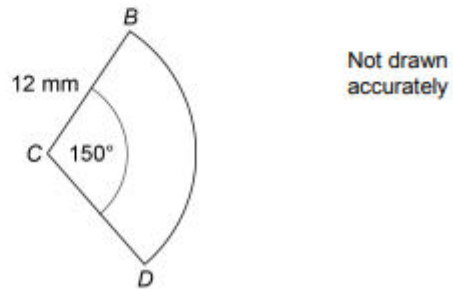
AQA GCSE – Thursday 6 November 2017 – Paper 2 (Calculator) Higher Tier

30.

- 22 The cross section of an earring is a semicircle, centre C , radius 25 mm
The earring is black and white.
The shaded area is black.



Sector BCD is white and has radius 12 mm



Is more than 20% of the semicircle white?
You **must** show your working.

[5 marks]

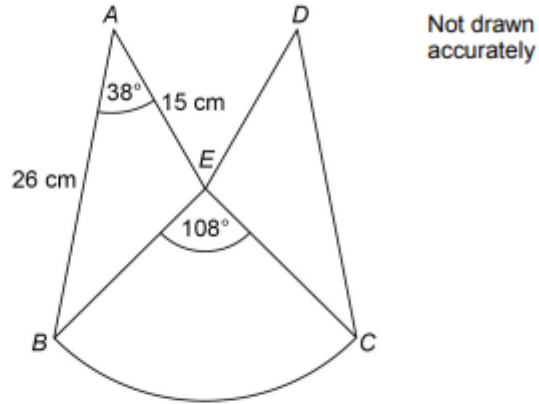
Answer _____

31.

25 The diagram shows a logo.

ABE and *DCE* are congruent triangles.

BCE is a sector of a circle, centre *E*.



Show that the area of the logo is 510 cm^2 to 2 significant figures.

[5 marks]
