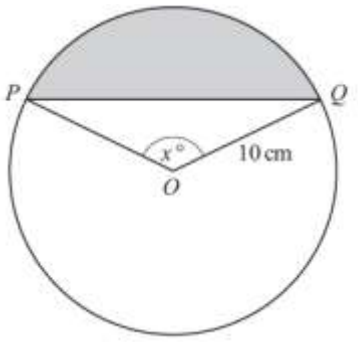
4.7 – Circle geometry

Student name: _____ Score: _____

1.



NOT TO SCALE

The diagram shows a circle, centre O, radius 10 cm.
PQ is a chord and angle $POQ = x°$.

(a) Write down, in terms of x and π, an expression for the area of the sector POQ.

Answer(a) ..... cm^2 [2]

(b) Write down, in terms of x, an expression for the area of the triangle POQ.

Answer(b) ..... cm^2 [2]

(c) Write down, in terms of x and π, an expression for the area of the shaded segment.

Answer(c) ..... cm^2 [1]

(d) The area of the **triangle** POQ is 25 cm^2.
Angle POQ is obtuse.

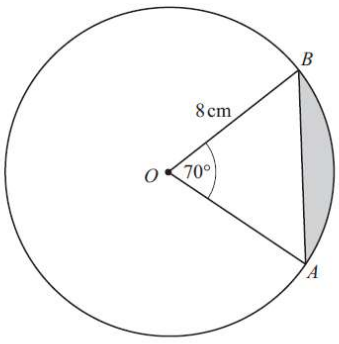
Show that $x = 150$.

[3]

(e) Find the area of the shaded segment.

Answer(e) ..... cm^2 [2]

2.



NOT TO SCALE

AB is a chord of the circle centre O.

Calculate

(a) the length of the chord AB,

Answer(a) ..... cm [3]

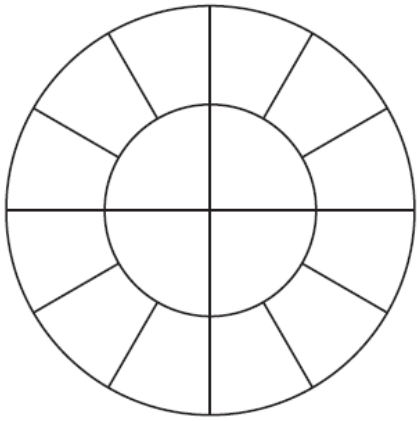
(b) the length of the arc AB,

Answer(b) ..... cm [2]

(c) the area of the shaded region.

Answer(c) ..... cm^2 [4]

3.



NOT TO SCALE

The diagram shows the top of a circular cake of **diameter** 30 cm.
The cake is cut into 16 pieces as shown in the diagram.

(a) (i) The top of each of the 16 pieces of cake has the same area.

Find the area of one of the pieces in square centimetres.

Answer(a)(i) ..... cm^2 [2]

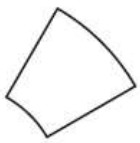
(ii) Write your answer to **part (a)(i)** in square metres.

Answer(a)(ii) ..... m^2 [1]

(iii) Show that the radius of the inner circle is 7.5 cm.

[2]

(b) The diagram shows the top of one of the outer pieces of cake.



NOT TO SCALE

(i) Calculate the perimeter of the top of this piece of cake.

Answer(b)(i) ..... cm [3]

(ii) The depth of the cake is 8 cm.

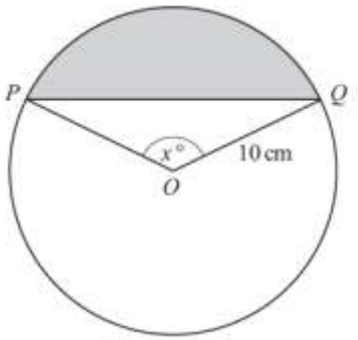
Calculate the **total** surface area of this piece of cake.

Answer(b)(ii) ..... cm^2 [3]

4.7 – Circle geometry

Student name: _____ Score: _____

1.



NOT TO SCALE

The diagram shows a circle, centre O, radius 10 cm.
PQ is a chord and angle $POQ = x°$.

(a) Write down, in terms of x and π, an expression for the area of the sector POQ.

Answer(a) $\frac{x}{360} \times \pi \times 10^2$ cm^2 [2]

(b) Write down, in terms of x, an expression for the area of the triangle POQ.

Answer(b) $0.5 \times 10 \times 10 \times \sin x$ cm^2 [2]

(c) Write down, in terms of x and π, an expression for the area of the shaded segment.

Answer(c) $\frac{x}{360}(\pi)(10^2) - 0.5(10)(10)\sin x$ cm^2 [1]

(d) The area of the **triangle** POQ is 25 cm^2.
Angle POQ is obtuse.
Show that $x = 150$.

$0.5(10)(10)\sin x = 25$

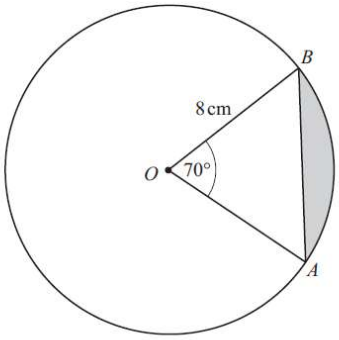
$\sin x = \frac{25}{50}$

$x = 30°$ or $x = 180° - 30° = 150°$ [3]

(e) Find the area of the shaded segment.

Answer(e) 106 cm^2 [2]

2.



NOT TO SCALE

AB is a chord of the circle centre O.

Calculate

(a) the length of the chord AB,

Answer(a) 9.18 cm [3]

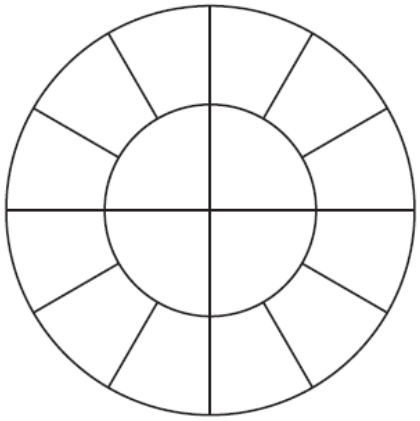
(b) the length of the arc AB,

Answer(b) 9.77 cm [2]

(c) the area of the shaded region.

Answer(c) 9.02 cm^2 [4]

3.



NOT TO SCALE

The diagram shows the top of a circular cake of **diameter** 30 cm.
The cake is cut into 16 pieces as shown in the diagram.

(a) (i) The top of each of the 16 pieces of cake has the same area.

Find the area of one of the pieces in square centimetres.

Answer(a)(i) 44.2 cm^2 [2]

(ii) Write your answer to **part (a)(i)** in square metres.

Answer(a)(ii) 0.0042 m^2 [1]

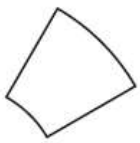
(iii) Show that the radius of the inner circle is 7.5 cm.

$\pi r^2 = \frac{1}{4}\pi 15^2$

$r^2 = 56.25$

[2]

(b) The diagram shows the top of one of the outer pieces of cake.



NOT TO SCALE

(i) Calculate the perimeter of the top of this piece of cake.

Answer(b)(i) 26.8 cm [3]

(ii) The depth of the cake is 8 cm.

Calculate the **total** surface area of this piece of cake.

Answer(b)(ii) 303 cm^2 [3]