

**Main Ideas/
Questions**

Area

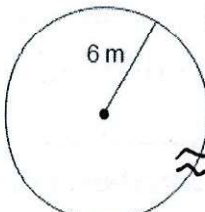
Notes

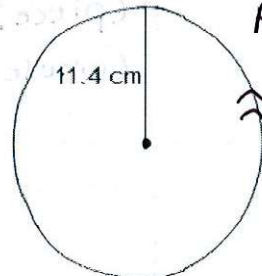
Area – The total space INSIDE a figure.

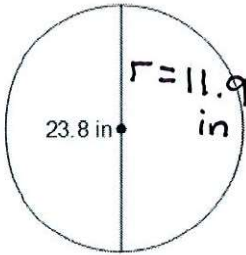
Formula: $A = \pi r^2$
 ↑ Area ↑ Units² r = radius

Examples

Find the area in terms of pi and a decimal rounded to the tenths.

1)  $A = \pi(6)^2$
 $= 36\pi$
 $\approx 113.1 \text{ m}^2$

2)  $A = \pi(11.4)^2$
 $\approx 408.3 \text{ cm}^2$

3)  $A = \pi(11.9)^2$
 $\approx 444.9 \text{ in}^2$
 diameter = 22 km
 $r = 11 \text{ km}$
 $A = \pi(11)^2$
 $= 121\pi$
 $\approx 380.1 \text{ km}^2$

Find the radius using the given area.

7) Area = $81\pi \text{ in}^2$
 $A = \pi r^2$
 $81\pi = \pi r^2$
 $\frac{81\pi}{\pi} = \frac{\pi r^2}{\pi}$
 $\sqrt{81} = \sqrt{r^2}$
 $9 \text{ in} = r$

8) area = 444.9 cm^2
 $444.9 = \frac{\pi r^2}{\pi}$
 $\sqrt{441.6} = \sqrt{r^2}$
 $11.9 \text{ cm} = r$

9) A circle has an area of $24\pi \text{ ft}^2$. What is the length of the diameter?

$24\pi = \frac{\pi r^2}{\pi}$
 $\sqrt{24} = \sqrt{r^2}$
 $4.9 = r$
 $2(4.9) = d$
 $9.8 \text{ ft} = d$

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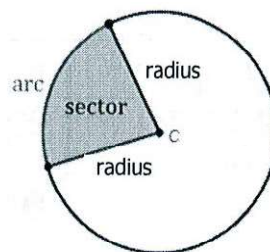
Sector Area
Characteristics

Notes

Sector Area – The area of a piece of the whole circle

Funny way to remember:

Sector Area = Pie filling



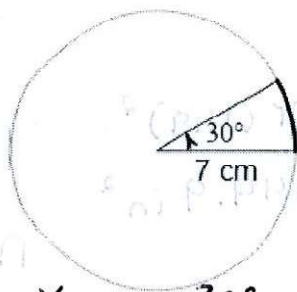
Formula:

$$\frac{\text{(piece) Sector Area}}{\text{(whole) Area } (\pi r^2)} = \frac{\text{Central Angle } (\theta)}{\text{Whole Circle in degrees } (360^\circ)}$$

Examples

Find the sector area of the wanted sector.

1)

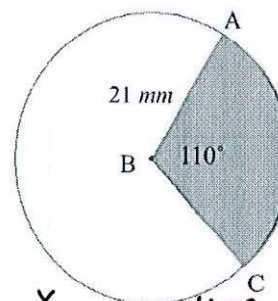


$$\frac{X}{\pi(7)^2} = \frac{30^\circ}{360^\circ}$$

$$\frac{1470\pi}{360} = \frac{360X}{360}$$

$$\boxed{12.8 \text{ cm}^2 = X}$$

2)



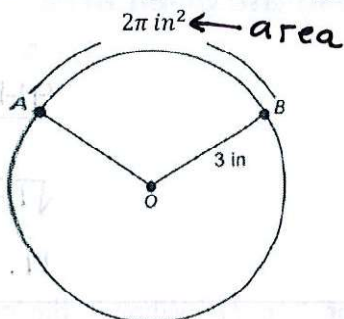
$$\frac{X}{\pi(21)^2} = \frac{110^\circ}{360^\circ}$$

$$\frac{360X}{360} = \frac{48510\pi}{360}$$

$$\boxed{X = 423.3 \text{ mm}^2}$$

Find the angle of the given sector.

3)

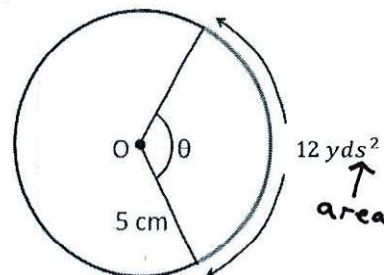


$$\frac{2\pi}{\pi(3)^2} = \frac{X}{360^\circ}$$

$$\frac{720\pi}{9\pi} = \frac{9\pi X}{9\pi}$$

$$\boxed{80^\circ = X}$$

4)



$$\frac{12}{\pi(5)^2} = \frac{X}{360^\circ}$$

$$\frac{25\pi X}{25\pi} = \frac{4320}{25\pi}$$

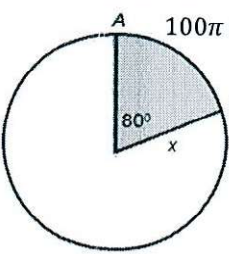
$$\boxed{X = 55^\circ}$$

**Main Ideas/
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Examples

Notes

Find the radius of the given sector.

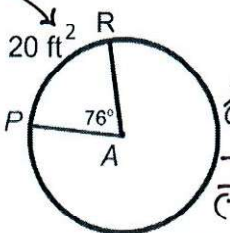
5)  $100\pi \text{ in}^2 \leftarrow \text{area}$

$$\frac{100\pi}{\pi x^2} \times \frac{80^\circ}{360^\circ}$$

$$\frac{36000\pi}{(80\pi)} = \frac{80\pi x^2}{80\pi}$$

$$\sqrt{450} = \sqrt{x^2}$$

21.2 in = x

6)  20 ft^2

$$\frac{20}{\pi x^2} \times \frac{76^\circ}{360^\circ}$$

$$\frac{7200}{(76\pi)} = \frac{76\pi x^2}{76\pi}$$

$$\sqrt{30.2} = \sqrt{x^2}$$

5.5 ft = x

7) A circle has an arc whose measure is 80° and whose area is 88π . What is the diameter of the circle?

$$\frac{88\pi}{\pi x^2} = \frac{80^\circ}{360^\circ} \Rightarrow \frac{80\pi x^2}{80\pi} = \frac{31680\pi}{80\pi}$$

$$\sqrt{x^2} = \sqrt{396}$$

$$x = 19.9 \rightarrow \boxed{d = 39.8}$$

8) The area of a circle is $36\pi \text{ ft}^2$. Find the area of the sector that has a central angle of 70° .

$$\frac{x}{36\pi} \times \frac{70^\circ}{360^\circ} \Rightarrow \frac{360x}{360} = \frac{2520\pi}{360}$$

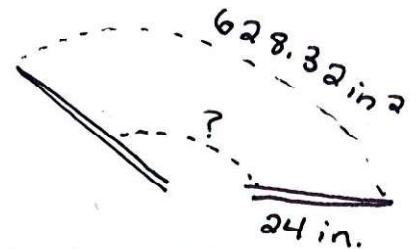
$x = 7\pi$ or 22 ft^2

9) A windshield wiper is 24 inches long. In one sweep, it covers 628.32 in^2 . What is the angle of the windshield wiper?

$$\frac{628.32}{\pi (24)^2} \times \frac{x}{360^\circ}$$

$$\frac{576\pi x}{576\pi} = \frac{226195.2}{(576\pi)}$$

$x = 125^\circ$



10) A clock is at 7 o'clock. If the radius of the hour hand is 5 inches long, what is the area that the hour hand has covered?

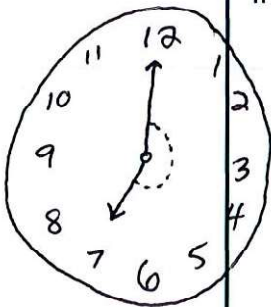
$$\frac{x}{\pi (5)^2} \times \frac{210^\circ}{360^\circ}$$

$$\frac{360x}{360} = \frac{5250\pi}{360}$$

$$\frac{360^\circ}{12} = \text{each hr } 30^\circ$$

$$7 \text{ o'clock} = 30^\circ \cdot 7 = 210^\circ$$

$x = 45.8 \text{ in}^2$



$$\frac{1200 - 100x}{100} = 10$$

$$1200 - 100x = 1000$$

$$200 = 100x$$

$$x = 2$$

$$x = 2$$

$$\frac{1000 - 100x}{100} = 10$$

$$1000 - 100x = 1000$$

$$0 = 100x$$

$$x = 0$$

$$x = 0$$

$$\frac{1000 - 100x}{100} = 10$$

$$1000 - 100x = 1000$$

$$0 = 100x$$

$$x = 0$$

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$$0 = 100x$$

$$x = 0$$

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$$1000 - 100x = 1000$$

$$0 = 100x$$

$$x = 0$$

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