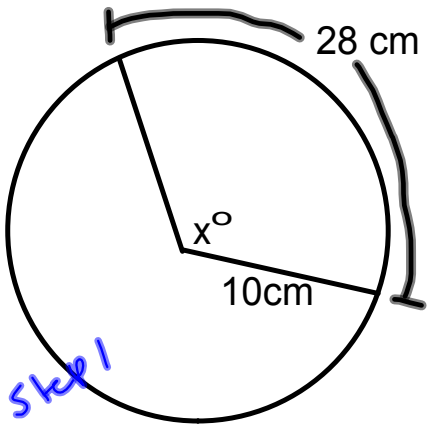
Warm Up
March 21, 2012

Find the missing angle.



Circumference = $2\pi r$

Step 1

$C = 2\pi r$
$= 2(3.14)(10)$
$= 62.8$ cm

Step 2

$$\frac{\text{Arc Length}}{\text{Circumference}} = \frac{\text{Angle}}{360^\circ}$$

$$\frac{28}{62.8} = \frac{x}{360^\circ}$$

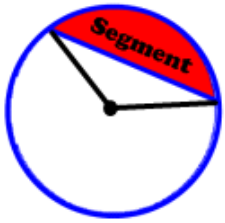
$62.8x = 360(28)$

$\frac{62.8x}{62.8} = \frac{10080}{62.8}$

$x = 160^\circ$

Solutions to Worksheet 6.18

Area of a Segment



Reminder: A segment of a circle is the region between a chord and the arc subtended by the chord. Any chord bounds two segments, which are different in area except when the chord is a diameter.

To find the area of a segment:

Step 1 – Calculate the area of the ***sector*** using:

1. $A = \Pi r^2$

2. $\frac{\text{Sector Area}}{\text{Area of Circle}} = \frac{\text{Angle}}{360^\circ}$

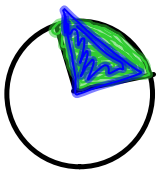
This will give you A_{sector}

Step 2 – Calculate the area of the ***triangle*** using:

$A_{triangle} = \frac{1}{2} r^2 \sin \theta$

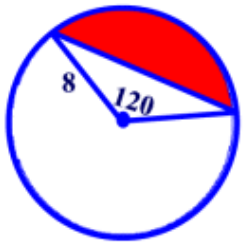
Step 3 – Calculate the area of the ***segment*** using:

$A_{segment} = A_{sector} - A_{triangle}$



Example Problem:

Find the area of a segment of a circle with a central angle of 120 degrees and a radius of 8 cm.
Express the answer to two places after the decimal.



Solution:

Step 1 – Calculate the area of the ***sector*** using:

1) $A = \pi r^2$

$= 3.14\ (8)^2$

$= 3.14\ (64)$

$= 200.96$

2) $\frac{\text{Sector Area}}{\text{Area of Circle}} = \frac{\text{Angle}}{360^\circ}$

$\frac{\text{Sector Area}}{200.96} = \frac{120^\circ}{360^\circ}$

$(\text{Sector Area})(360^\circ) = (200.96)(120^\circ)$

$(\text{Sector Area})(360^\circ) = (24115.2)$

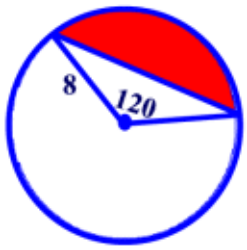
$\frac{(\text{Sector Area})(360^\circ)}{360^\circ} = \frac{(24115.2)}{360^\circ}$

Sector Area = 67 cm^2

Step 2 – Calculate the area of the ***triangle*** using:

$$A_{triangle} = \tfrac{1}{2} r^2 \sin\theta$$
$$= \tfrac{1}{2} (8 \text{ cm})^2 \sin(120^\circ)$$
$$= \tfrac{1}{2} (64 \text{ cm}^2)(0.8660)$$
$$= \tfrac{1}{2} (55.4240 \text{ cm}^2)$$
$$= 27.7120 \text{ cm}^2 \text{ or } 27.71 \text{ cm}^2$$

0.866(64) / 2



Step 3 – Calculate the area of the ***segment*** using:

sector triangle

$$A_{segment} = A_{sector} - A_{triangle}$$
$$= 67.02 \text{ cm}^2 - ?$$
$$=$$

Attachments

Solutions to Ex. 6.18.notebook