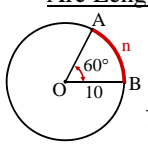
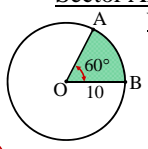
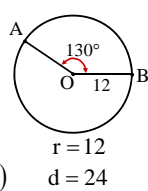


Lesson 11-3

Objective – To find arc lengths and sector areas.

<p><u>Arc Length</u></p>  <p>Whole Circle $C = \pi \cdot d$</p> <p>Arc Length $\frac{1}{6}$ of $\pi \cdot 20 = \frac{20\pi}{6}$</p> <p>Arc Length = $\frac{10\pi}{3}$</p> <p>Arc length is part of circumference.</p> <p>Part = $\frac{n}{360^\circ} = \frac{60^\circ}{360^\circ} = \frac{1}{6}$</p> <p>$L = \frac{n}{360^\circ}(\pi d)$</p>	<p><u>Sector Area</u></p>  <p>Whole Circle $A = \pi \cdot r^2$</p> <p>Sector Area $\frac{1}{6}$ of $\pi \cdot 10^2$</p> <p>Area = $\frac{100\pi}{6} = \frac{50\pi}{3}$</p> <p>A sector is part of a whole circular region.</p> <p>Part = $\frac{n}{360^\circ} = \frac{60^\circ}{360^\circ} = \frac{1}{6}$</p> <p>$A = \frac{n}{360^\circ}(\pi r^2)$</p>
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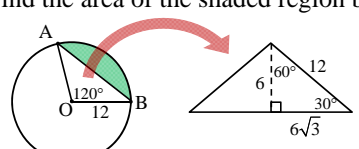
Find the arc length and sector area of the circle below.



1) $L = \frac{n}{360^\circ}(\pi d)$
 $L = \frac{130^\circ}{360^\circ}(\pi \cdot 24)$
 $L = \frac{13}{36}(\frac{24\pi}{1})$
 $L = \frac{26\pi}{3} \approx 27.3 \text{ un.}$

2) $A = \frac{n}{360^\circ}(\pi \cdot r^2)$
 $A = \frac{130^\circ}{360^\circ}(\pi \cdot 12^2)$
 $A = \frac{13}{36}(\frac{144\pi}{1})$
 $A = 52\pi \approx 16.4 \text{ un}^2$

Find the area of the shaded region below.



Plan: $A = A_{\text{Sector}} - A_{\text{Triangle}}$

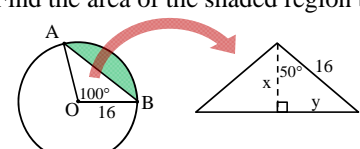
Formula: $A = \frac{n}{360^\circ}(\pi r^2) - \frac{1}{2}b \cdot h$

Substitute: $A = \frac{60^\circ}{360^\circ}(\pi \cdot 12^2) - \frac{1}{2}(12\sqrt{3})(6)$

Actual: $A = 24\pi - 36\sqrt{3}$

Estimate: $A \approx 13.0 \text{ un}^2$

Find the area of the shaded region below.



Plan: $A = A_{\text{Sector}} - A_{\text{Triangle}}$

Formula: $A = \frac{n}{360^\circ}(\pi r^2) - \frac{1}{2}b \cdot h$

Substitute: $A = \frac{100^\circ}{360^\circ}(\pi \cdot 16^2) - \frac{1}{2}(10.3)(24.6)$

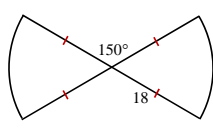
Simplify: $A \approx 223.4 - 126.7$

Estimate: $A \approx 96.7 \text{ un}^2$

$\cos 50^\circ = \frac{x}{16}$
 $x = 16 \cdot \cos 50^\circ$
 $x \approx 10.3$
 $h \approx 10.3$

$\sin 50^\circ = \frac{y}{16}$
 $y = 16 \cdot \sin 50^\circ$
 $y \approx 12.3$
 $b = 2y$
 $b \approx 24.6$

Find the perimeter and area of the figure below in terms of π .



$r = 18$
 $d = 36$

Perimeter
 $P = 4 \text{ sides} + 2 \text{ arcs}$
 $P = 4(18) + 2(3\pi) = 72 + 6\pi$

Area
 $\text{Area} = 2\left(\frac{30^\circ}{360^\circ}(\pi \cdot 18^2)\right)$
 $\text{Area} = \frac{1}{6}(324\pi)$
 $\text{Area} = 54\pi$

Each arc = $\frac{30^\circ}{360^\circ}(\pi \cdot 36)$
 Each arc = 3π