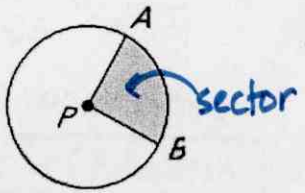
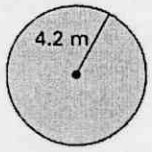
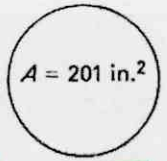
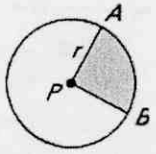
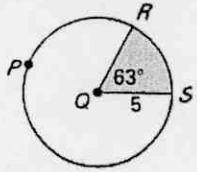
Section 11.5 Date _____

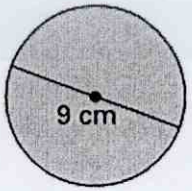
Area of Circles and Sectors

VOCABULARY	DEFINITION	EXAMPLE
SECTOR of a CIRCLE	A sector of a circle is the region bounded by two radii of the circle and their intercepted arc.	 Sector APB
THEOREM 11.9 AREA of a CIRCLE	The area of a circle is π times the square of the radius. $A = \pi$ ___r^2___	**Find the indicated measure.**  $A = \pi r^2$ **a. Area**  $r = 4.2$ $A = \pi r^2$ $A = \pi(4.2)^2$ $A = 17.64\pi\ m^2$ $= 55.4\ m^2$ **b. Diameter**  $A = \pi r^2$ $A = 201$ $\frac{201}{\pi} = \frac{\pi r^2}{\pi}$ $\sqrt{r^2} = \sqrt{\frac{201}{\pi}}$ $r = \sqrt{\frac{201}{\pi}} = 8$ $d = 2(8)$ $d = 16$ in
THEOREM 11.10 AREA of a SECTOR	The ratio of the area of a sector of a circle to the area of the whole circle (πr^2) is equal to the measure of the intercepted arc to 360°. $\frac{\text{Area Sector}}{\text{Area } \pi r^2} = \frac{\text{central } \angle}{360°}$	 **Find the areas of the sectors formed by ∠RQS.**  Shaded $\frac{x}{\pi(5)^2} = \frac{63°}{360°}$ $\frac{360x}{360} = \frac{63(25\pi)}{360}$ $A(\text{shaded sector}) = 13.7\ u^2$ $\frac{\text{Area of sector } APB}{\pi r^2} = \frac{m\overset{\frown}{AB}}{360°}$, or Area of sector $APB = \frac{m\overset{\frown}{AB}}{360°} \cdot \pi r^2$ unshaded Area = circle − shaded $= \pi(5)^2 - 13.7$ unshaded Area $= 64.8\ u^2$

central ∠ = measure of the Arc
central ∠ = $m\overset{\frown}{AB}$

EXAMPLES:

Area



$d = 9$

$r = 9/2$

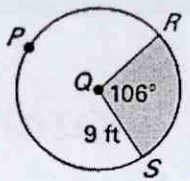
$r = 4.5$

$A = \pi r^2$ $\quad A = \pi(4.5)^2$

$A = 20.25\pi \text{ cm}^2$

$= 63.6 \text{ cm}^2$

Find the areas of the sectors formed by $\angle RQS$.



shaded

$\frac{x}{\pi(9)^2} = \frac{106}{360}$

$360x = 106(81\pi)$

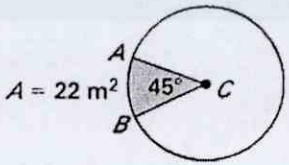
$A(\text{shaded}) = 74.9 \text{ ft}^2$

$A(\text{unshaded}) = \text{Area} - \text{shaded}$

$= \pi(9)^2 - 74.9$

$A(\text{unshaded}) = 179.6 \text{ ft}^2$

Use the diagram to find the area of ⊙C.

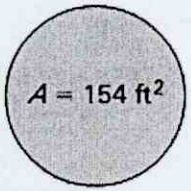


$\frac{22}{x} = \frac{45}{360}$

$45x = 360(22)$

$A(\odot C) = 176 \text{ m}^2$

Radius



$A = 154 \text{ ft}^2$

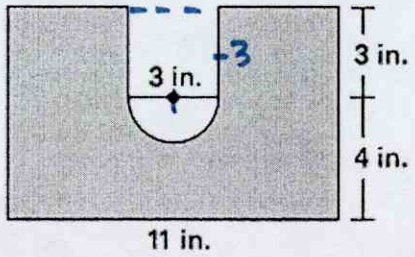
$A = \pi r^2$

$\frac{154}{\pi} = \frac{\pi r^2}{\pi}$

$\sqrt{r^2} = \sqrt{\frac{154}{\pi}}$

$r = 7 \text{ ft}$

Construction A contractor needs to cut a section out of a rectangular piece of wood as shown. To the nearest square inch, what is the area of the remaining wood?



$A(\text{Rectangle}) - \left[A(\text{square}) + \frac{A(\text{circle})}{2}\right]$

bh $\quad s^2$ $\quad \frac{\pi(1.5)^2}{2}$

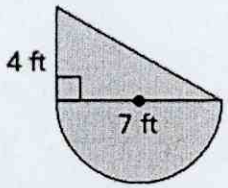
$11(7)$ $\quad 3^2$

$77 - [9 + 3.5]$

$77 - 12.5$

$A = 64.5 \text{ in}^2$

Find the area of the figure.



$A(\triangle) + \frac{A(\text{circle})}{2}$

$\frac{bh}{2}$ $\quad \frac{\pi(3.5)^2}{2}$

$\frac{7(4)}{2}$

$14 + 19.2$

$A = 33.2 \text{ ft}^2$