Topic: Arc Length	**Things to Remember:**
	✓ Circumference = $2\pi r$ ✓ r = radius ✓ $\dfrac{arc\ length}{circumference\ (2\pi r)} = \dfrac{angle}{360°} =$

Examples:

1. Find the <u>circumference</u>, **in terms of pi**, given the diameter is 14 feet. $r = \cancel{14}\ 7$

$C = 2\pi (\cancel{14}\ 7)$

$C = \cancel{\ }\ 14\pi$ ft

2. Find the radius given the <u>circumference</u> is 25π in.

$C = 2\pi r$

$\dfrac{25\pi}{(2\pi)} = \dfrac{2\pi r}{2\pi}$

$\boxed{12.5\ in = r}$

3. Find the <u>arc length</u> of the shaded section.

$\dfrac{x}{2\pi (3)} \times \dfrac{40°}{360°}$

$\dfrac{240\pi}{360} = \dfrac{360x}{360}$

$\boxed{2.09 = x}$

4. Find the <u>arc length</u> of the **shaded section** ✳

$\dfrac{x}{2\pi (6)} \times \dfrac{90°}{360°}$

$\dfrac{360x}{360} = \dfrac{1080\pi}{360}$

$\boxed{x = 3\pi\ OR\ 9.4}$

270°   6   90°
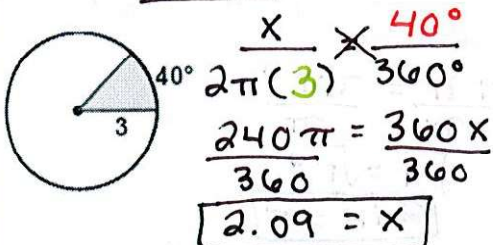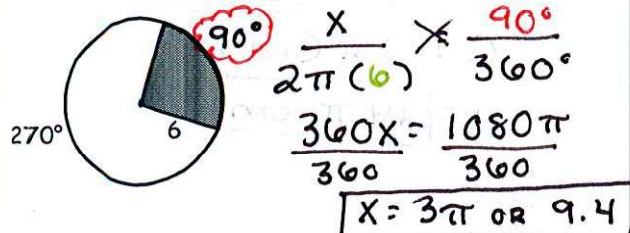
5. A golf club is swung around to hit a golf ball that created a <u>distance</u> of 15 feet around. If the golf club is 3.67 feet, what was the angle?

$\dfrac{15}{2\pi (3.67)} \times \dfrac{x}{360°}$

$\dfrac{23.06x}{23.06} = \dfrac{5400}{23.06}$

$\boxed{x = 234.17°}$

6. If it's 4 o'clock on the classroom clock and the distance the hour hand has traveled is 12.57 in, what is the <u>length of the hour hand (radius)</u>?

$\dfrac{12.57}{2\pi x} \times \dfrac{120°}{360°}$

$\dfrac{240\pi x}{(240\pi)} = \dfrac{4525.2}{(240\pi)}$

$\boxed{x = 6\ in}$

Topic: Sector Area	**Things to Remember:**
	✓ Area = πr^2 ✓ $\dfrac{sector\ area}{Area\ (\pi r^2)} = \dfrac{angle}{360°}$

Examples:

7. Find the area, **in terms of pi**, given the radius is 14 feet.

$A = \pi (14)^2$

$\boxed{A = 196\pi\ ft^2}$

8. Find the <u>diameter</u> given the <u>area</u> is 25π in.
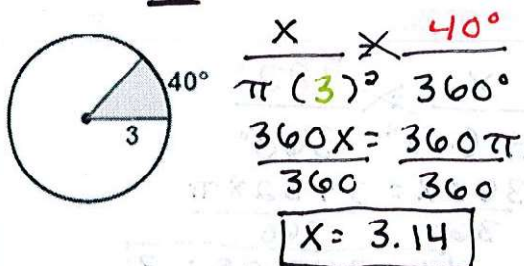
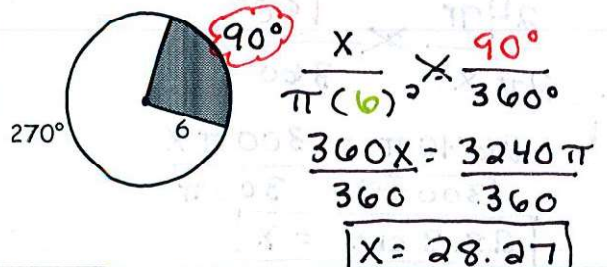$A = \pi r^2$

$\dfrac{25\pi}{\pi} = \dfrac{\pi r^2}{\pi}$

$\sqrt{25} = \sqrt{r^2}$

$\boxed{5\ in = r} \rightarrow \boxed{10\ in = d}$

9. Find the area of the shaded section.

$\dfrac{x}{\pi (3)^2} \times \dfrac{40°}{360°}$

$\dfrac{360x}{360} = \dfrac{360\pi}{360}$

$\boxed{x = 3.14}$

40°   3

10. Find the area of the **shaded section**

$\dfrac{x}{\pi (6)^2} \times \dfrac{90°}{360°}$

$\dfrac{360x}{360} = \dfrac{3240\pi}{360}$

$\boxed{x = 28.27}$

270°   6   90°

11. The <u>area</u> of one piece of pizza is 9π in^2. The pizza is cut into <u>eighths</u> (*HINT: Find the angle measure using a similar the method we did for the clock*). Find the <u>radius</u> of the pizza pie.

$\dfrac{360°}{8} = 45°$

$\dfrac{9\pi}{\pi x^2} \diagup\!\!\!\!\times \dfrac{45°}{360°}$

$\dfrac{45\pi x^2}{45\pi} = \dfrac{3240\pi}{45\pi}$

$\sqrt{x^2} = \sqrt{72}$

$\boxed{X = 8.49 \text{ in}}$

12. A sprinkler system can shoot water out a distance of 6 yards. If the sprinkler system can cover an area of 75.4 yds^2, then what angle is the sprinkler system using?

$\dfrac{75.4}{\pi(6)^2} \diagup\!\!\!\!\times \dfrac{X}{360°}$

$\dfrac{36\pi X}{36\pi} = \dfrac{27144}{(36\pi)}$

$\boxed{X = 240°}$

Mixed Review

13. Find the **circumference**, **in terms of pi**, of a circle with a radius of 12 cm.

$C = 2\pi(12)$

$= \boxed{24\pi \text{ cm}}$

14. Calculate the <u>radius</u> of a circle that has an <u>area</u> of 4π in.^{2} **Round to the nearest hundredths.**

$\dfrac{4\pi}{\pi} = \dfrac{\pi r^2}{\pi}$
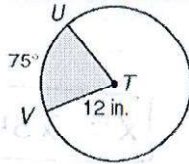
$\sqrt{4} = \sqrt{r^2}$

$\boxed{2 \text{ in} = r}$

15. What is the **area** of a 30° <u>sector</u> of a circle with a radius of 5.5 inches?

$\dfrac{X}{\pi(5.5)^2} \diagup\!\!\!\!\times \dfrac{30°}{360°}$

$\dfrac{360X}{360} = \dfrac{2851}{360}$

$\boxed{X = 7.9 \text{ in}^2}$

16. Find the **arc length** of the shaded sector. **Round to the nearest hundredths.**

$\dfrac{X}{2\pi(12)} \diagup\!\!\!\!\times \dfrac{75°}{360°}$

$\dfrac{360X}{360} = \dfrac{1800\pi}{360}$

$\boxed{X = 15.71 \text{ in}}$

17. Find the <u>central angle</u> of a sector that has a **length** of 15π mm and a radius of 18 mm. **Round to the nearest hundredths.**

$\dfrac{15\pi}{2\pi(18)} \diagup\!\!\!\!\times \dfrac{X}{360°}$

$\dfrac{5400\pi}{36\pi} = \dfrac{36\pi X}{36\pi}$

$\boxed{X = 150°}$

18. Find the <u>central angle</u> of a sector that has an <u>area</u> of 23 km^2 and a **diameter** of 10 km. $r = 5$ **Round to the nearest hundredths.**

$\dfrac{23}{\pi(5)^2} \diagup\!\!\!\!\times \dfrac{X}{360°}$

$\dfrac{8280}{(25\pi)} = \dfrac{25\pi X}{25\pi}$

$\boxed{X = 105.4°}$

19. If the **length** of a sector is 24π cm and its central angle measure is 150°, what is radius of the circle? **Round to the nearest hundredths.**

$\dfrac{24\pi}{2\pi X} \diagup\!\!\!\!\times \dfrac{150°}{360°}$

$\dfrac{8640\pi}{(300\pi)} = \dfrac{300\pi X}{300\pi}$

$\boxed{28.8 \text{ cm} = X}$

20. A windshield wiper blade is 18 inches long. To the nearest square inch, what is the **area** covered by the blade as it rotates through an angle of 122°? **Round to the nearest hundredths.**

$\dfrac{X}{\pi(18)^2} \diagup\!\!\!\!\times \dfrac{122°}{360°}$

$\dfrac{360X}{360} = \dfrac{39528\pi}{360}$

$\boxed{X = 344.95 \text{ in}^2}$