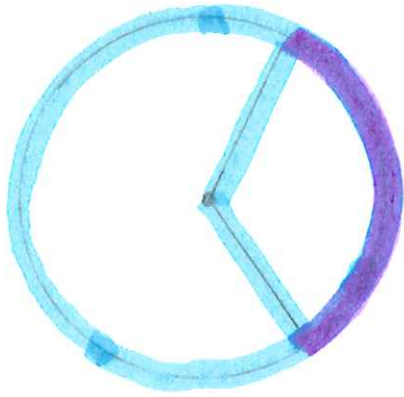
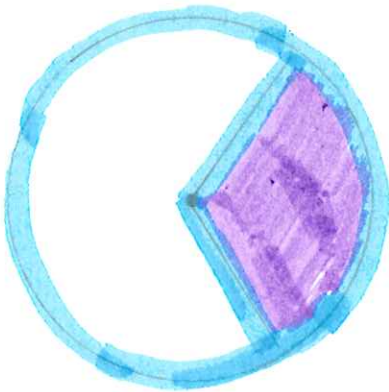


Arc Length / Area of Sector



The blue (purple) part of the circle is called an arc.

Arc length is related to circumference.



The purple shaded part of the circle is called the area of the sector.

The area of the sector is related to area of the circle.



Find the circumference.

Step 1: Write down the formula. $C = 2\pi r$

Step 2: Plug in the given information.

$$C = 2\pi(18)$$

Step 3: Simplify.

$$C = 36\pi \text{ in or } 113.1 \text{ in}$$



Find the circumference.

Step 1: Write down the formula. $C = \pi d$

Step 2: Plug in the given information.

$$C = \pi (20)$$

Step 3: Simplify.

$$C = 20\pi \text{ in or } 62.8 \text{ in}$$



Find the area of the circle.

Step 1: Write down the formula. $A = \pi r^2$

Step 2: Plug in the given information.

$$A = \pi r^2 = \pi (5)^2$$

Step 3: Simplify.

$$A = 25 \pi \text{ in}^2 \text{ or } 78.5 \text{ in}^2$$



Find the area of the circle.

Step 1: Write down the formula. $A = \pi r^2$

Step 2: Plug in the given information.

$$r = 50/2 = 25 \quad \left\{ \quad A = \pi (25)^2$$

Step 3: Simplify.

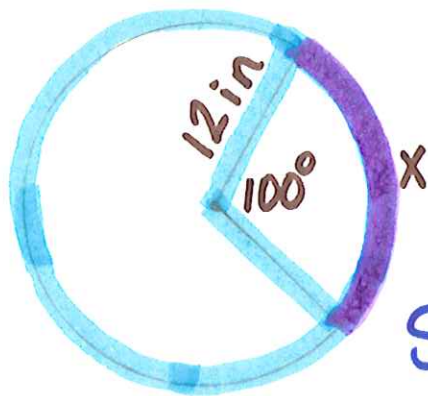
$$A = 625 \pi \text{ in}^2 \text{ or } 1963.5 \text{ in}^2$$

Arc Length

$$\frac{\angle \text{ measure}}{360} = \frac{\text{arc length}}{\text{circumference}}$$

Area of Sector

$$\frac{\angle \text{ measure}}{360} = \frac{\text{area of sector}}{\text{area of circle}}$$



Find the length of the purple arc.

Step 1: Is arc length related to area or circumference?
circumference

Step 2: Set up the proportion.

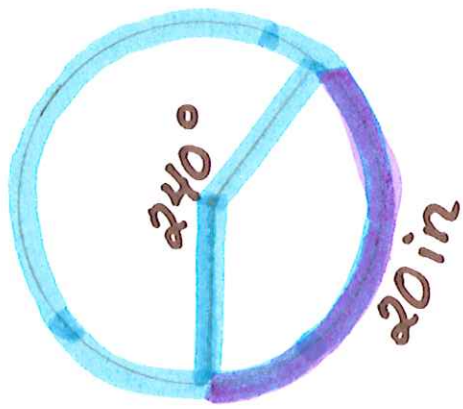
$$\frac{100}{360} = \frac{?}{2\pi(r)}$$

Step 3: Solve the proportion.

$$\frac{100}{360} = \frac{\quad}{50.3}$$

$$\frac{100(50.3)}{360}$$

13.97



Find the length of the radius.

Step 1: Area or Circumference?
circumference

Step 2: Set up the proportion.

$$\begin{array}{r} 360 \\ - 240 \\ \hline 120^\circ \end{array}$$

$$\frac{120}{360} = \frac{20}{?}$$

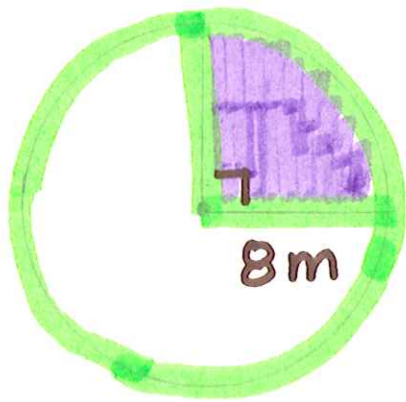
Step 3: Solve the proportion.

$$\frac{360(20)}{120} = 60$$

Step 4: Answer the question.

$$C = 2\pi r$$
$$\frac{60}{2\pi} = \frac{2\pi r}{2\pi}$$

$$r = 9.5 \text{ in}$$



Find the area of the shaded sector.

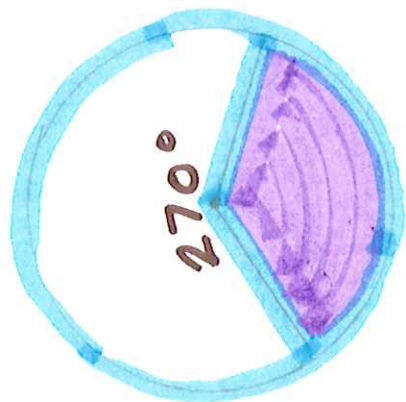
Step 1: Related to area or circumference?
circumference

Step 2: Set up the proportion.

$$\frac{90}{360} = \frac{?}{\pi(8)^2}$$

Step 3: Solve the proportion.

$$\frac{90(\pi)(8)^2}{360} = 50.3 \text{ m}^2$$



If the shaded sector has an area of 56 in^2 , how long is the radius?

Step 1: Related to area or circumference?
area

Step 2: Set up the proportion.

$$\begin{array}{r} 360 \\ -270 \\ \hline 90 \end{array} \quad \frac{90}{360} = \frac{56}{?}$$

Step 3: Solve the proportion.

$$\frac{360(56)}{90} = 224 \Rightarrow \text{area of } \bigcirc$$

Step 4: Answer the question.

$$\begin{aligned} A &= \pi r^2 \\ 224 &= \pi r^2 \\ \frac{224}{\pi} &= r^2 \end{aligned}$$

$$\begin{aligned} 71.3 &= r^2 \\ \sqrt{71.3} &= \sqrt{r^2} \\ 8.4 &= r \end{aligned}$$

8.4 in