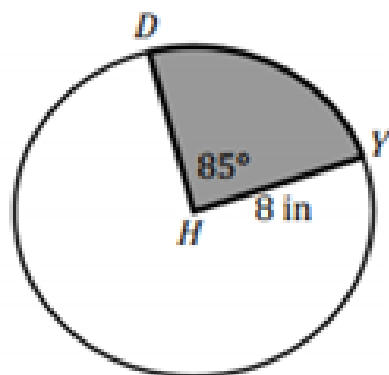


### Informal Assessment:

In Sarah's family, the birthday person always gets to cut the first piece of cake. Sarah is celebrating her birthday with both of her parents, her two brothers, and her best friend. She cuts her piece of birthday cake as shown by the sector below.



- (A)  $30.718 \text{ in}^2$
- (B)  $47.473 \text{ in}^2$
- (C)  $153.589 \text{ in}^2$
- (D)  $201.062 \text{ in}^2$

If the rest of the party equally shares the remaining portion of the cake, what is approximate area each one receives?

$$\frac{x}{\pi 8^2} = \frac{85}{360}$$

$$\frac{x}{\pi 64} = \frac{17}{72} \quad x = 30.7078$$

$$72x = 3478.0328$$

$$x = 47.4729$$

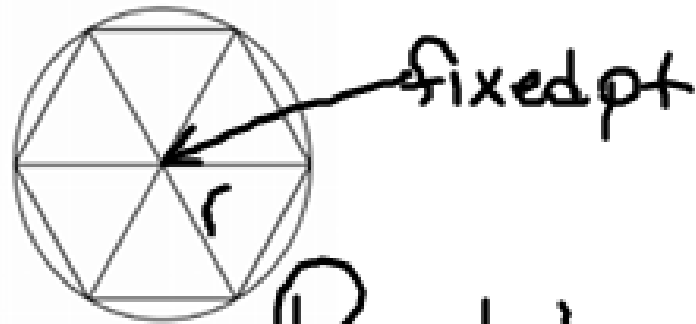
$$x = 207.0611$$

$$x = 153.5877$$


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$$5$$

$\pi 8^2 =$



For one complete Revolution of a circle, we have the circumference,  $d\pi$  or  $2\pi r$

Radius is the size of the circle and determines the arc measure

Radians represent the number of times the radius goes around a fixed point

Radians is define by an arc of a circle.

Radians represents the  $360^\circ$  needed to complete one revolution.

Therefore, in radians the angle around the circle is

$$\frac{2\pi}{360} \quad \frac{\pi}{180}$$

To convert from Degrees to Radians multiply the angle by  $\frac{\pi}{180}$

To convert from Radians to degrees multiply the angle by  $\left(\frac{180}{\pi}\right)$

Practice:

Perform the following conversions.

1. Convert  $160^\circ$  to radians.

$$\frac{160 \cancel{\pi}}{9 \cancel{180}} = \frac{8\pi}{9}$$

2. Convert  $\frac{11\pi}{6}$  radians to degrees.

$$\frac{11 \cancel{\pi}}{\cancel{6}} \left( \frac{180}{\cancel{\pi}} \right) = 330^\circ$$

What is the length of an arc with a measure of  $60^\circ$  in a circle with a 10-centimeter radius?

$$\frac{x}{20\pi} = \frac{160}{360}$$

$$\begin{aligned} \frac{x}{20\pi} &= \frac{1}{6} \\ 6x &= 20\pi \\ x &= \frac{10\pi}{3} \end{aligned}$$

$$\begin{array}{r}
 63 \\
 5 \overline{) 315} \\
 \underline{30} \phantom{0} \\
 15 \phantom{0} \\
 \underline{15} \phantom{0} \\
 0
 \end{array}$$

Your turn:

Convert  $315^\circ$  to radians.

$$\begin{array}{r}
 315\pi \\
 \hline
 180
 \end{array}
 \quad
 \begin{array}{r}
 \cancel{63\pi} \\
 \hline
 \cancel{36}
 \end{array}$$

$$\begin{array}{r}
 7\pi \\
 \hline
 4
 \end{array}$$

Convert  $\frac{5\pi}{4}$  to degrees.

$$\begin{array}{r}
 5\pi \\
 \hline
 4
 \end{array}
 \quad
 \begin{array}{r}
 45 \\
 \hline
 180 \\
 \hline
 7\pi
 \end{array}$$

$225^\circ$

$$\begin{array}{r}
 45 \\
 4 \overline{) 180} \\
 \underline{16} \phantom{0} \\
 20 \\
 \underline{20} \\
 0
 \end{array}$$

An arc with a measure of  $120^\circ$  has an arc length of  $10\pi$  inches.  
 What is the radius of the circle on which the arc sits?