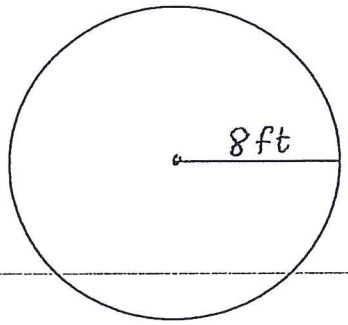
Circumference and Arc Length

Unit 7: Circles

Use the diagram to find the indicated measure:

1. Find the circumference.

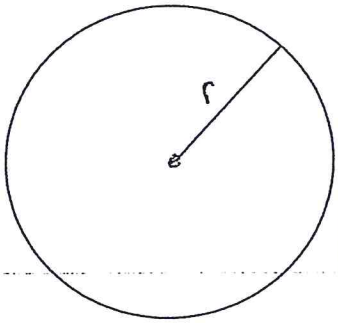


$C = 2\pi r$

$C = 2\pi(8)$

$C = 16\pi$

2. Find the radius, given C = 65.98 cm



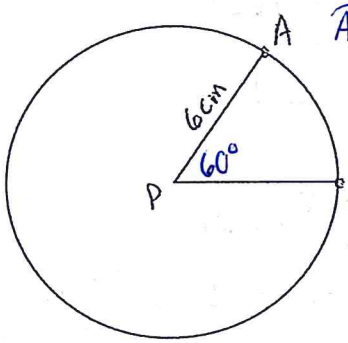
$C = 2\pi r$

$\frac{65.98}{2\pi} = \frac{2\pi r}{2\pi}$

$\frac{32.99}{\pi} = r$

Find the length of $\overset{\frown}{AB}$.

3.



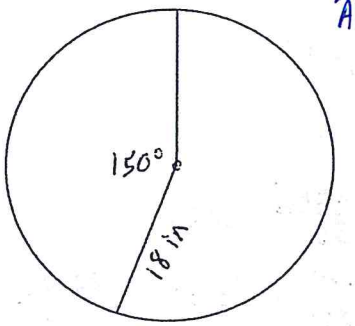
$\overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi r$

$= \frac{60}{360} \cdot \frac{2\pi(6)}{1}$

$= \frac{720\pi}{360}$

$= 2\pi$

4.



$\overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi r$

$= \frac{150}{360} \cdot \frac{2\pi(18)}{1}$

$= \frac{5400\pi}{360}$

$= 15\pi$

Find the indicated measure:

5. The exact radius of a circle with circumference 42 meters.

$C = 2\pi r$

$\frac{42}{2\pi} = \frac{2\pi r}{2\pi}$

$r = \frac{21}{\pi}$

6. The exact diameter of a circle with circumference 39 centimeters.

$C = \pi d$

$\frac{39}{\pi} = \frac{\pi d}{\pi}$

$d = \frac{39}{\pi}$

7. The exact circumference of a circle with diameter 15 inches.

$C = \pi d$

$C = \pi(15)$

$C = 15\pi$

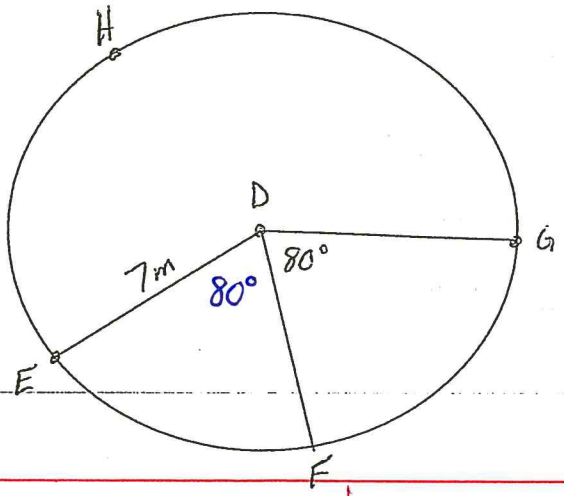
8. The exact circumference of a circle with radius 27 feet.

$C = 2\pi r$

$C = 2\pi(27)$

$C = 54\pi$

Given the following circle and $\angle EDF \cong \angle FDG$. Find the indicated measure.



9. m $\overline{EFG}$ $= m\overset{\frown}{EF} + m\overset{\frown}{FG}$

$80° + 80°$

$\boxed{160°}$

10. m $\overline{EHG}$ $= 360 - m\overset{\frown}{EFG}$

$360° - 160°$

$\boxed{200°}$

11. Length of $\overline{EFG}$

$\overset{\frown}{EFG} = \frac{m\overset{\frown}{EFG}}{360} \cdot 2\pi r$

$= \frac{160}{360} \cdot \frac{2\pi(7)}{360} = \frac{2240\pi}{360} = \boxed{\frac{56}{9}\pi}$

12. Length of $\overline{EHG}$

$\overset{\frown}{EHG} = \frac{m\overset{\frown}{EHG}}{360} \cdot 2\pi r$

$= \frac{200}{360} \cdot \frac{2\pi(7)}{1} = \frac{2800\pi}{360} = \boxed{\frac{70}{9}\pi}$

13. m $\overline{EHF}$ $= 360° - m\overset{\frown}{EF}$

$360° - 80°$

$\boxed{280°}$

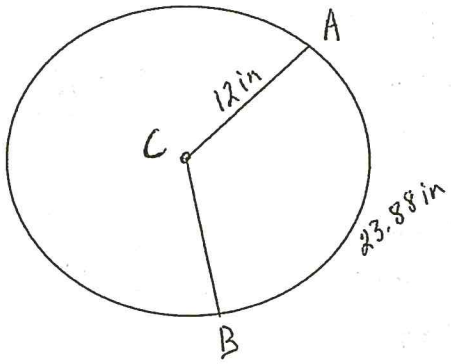
14. Length of $\overline{FEG}$ $m\overset{\frown}{FEG} = 360 - \overset{\frown}{FG} = 360 - 80 = 280°$

$\overset{\frown}{FEG} = \frac{m\overset{\frown}{FEG}}{360} \cdot 2\pi r$

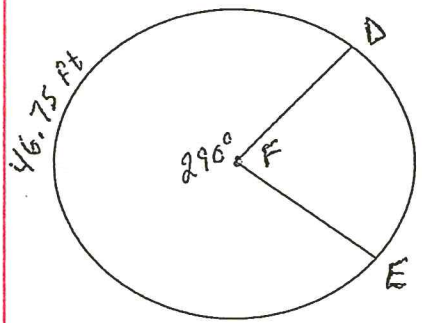
$= \frac{280}{360} \cdot \frac{2\pi(7)}{1} = \frac{3920\pi}{360} = \boxed{\frac{98}{9}\pi}$

Find the indicated measure:

15. m $\overset{\frown}{AB}$



16. Circumference of the circle.



(15)

$$\overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi r$$

$$360\left[23.88 = \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi(12)\right]360$$

$$\frac{8596.8}{24\pi} = \frac{m\overset{\frown}{AB} \cdot 24\pi}{24\pi}$$

$$\frac{358.2}{\pi} = m\overset{\frown}{AB}$$

$$\frac{1791}{5\pi} =$$

$$114^\circ \approx$$

(16)

$$\overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi r$$

OR

$$\overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360} \cdot C$$

$$\frac{360}{290}\left[46.75 = \frac{290}{360} \cdot C\right]\frac{360}{290}$$

$$\frac{1683}{29} = C$$

$$58 \text{ ft} \approx$$