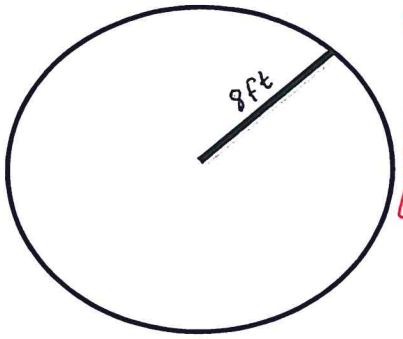
Circles

Emphasis on Circumference & Arc Length

Use the diagram to find the indicated measure:

1. Find the circumference.

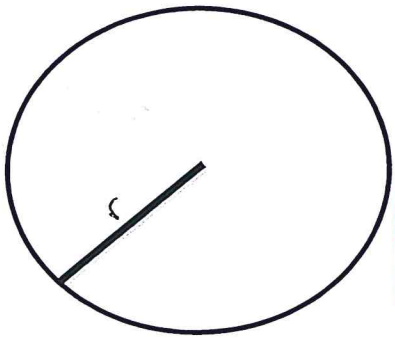


$C = 2\pi r$

$C = 2\pi(8)$

$C = 16\pi$

2. Find the radius, given C = 65.98 cm



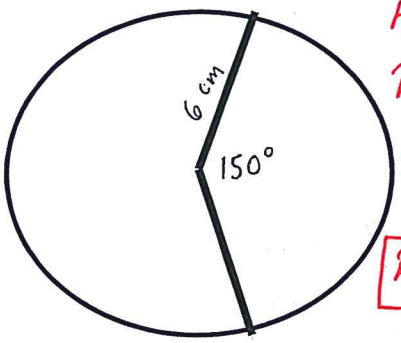
$C = 2\pi r$

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

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

Find the length of $\widehat{AB}$.

3.



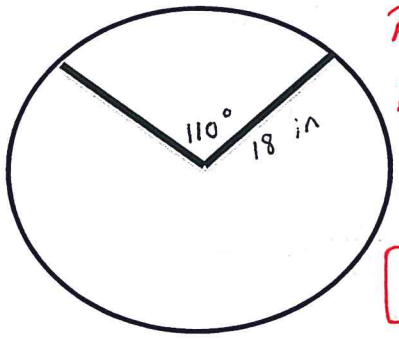
$\widehat{AB} = \frac{m\widehat{AB}}{360} \cdot 2\pi r$

$\widehat{AB} = \frac{150}{360} \cdot \frac{2\pi(6)}{1}$

$\widehat{AB} = \frac{1800\pi}{360}$

$\widehat{AB} = 5\pi$

4.



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

$\widehat{AB} = \frac{110}{360} \cdot \frac{2\pi(18)}{1}$

$\widehat{AB} = \frac{3960\pi}{360}$

$\widehat{AB} = 11\pi$

Find the indicated measure:

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

$C = 2\pi r \rightarrow \frac{42}{2\pi} = \frac{2\pi r}{2\pi} \rightarrow \frac{21}{\pi} = r$

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

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

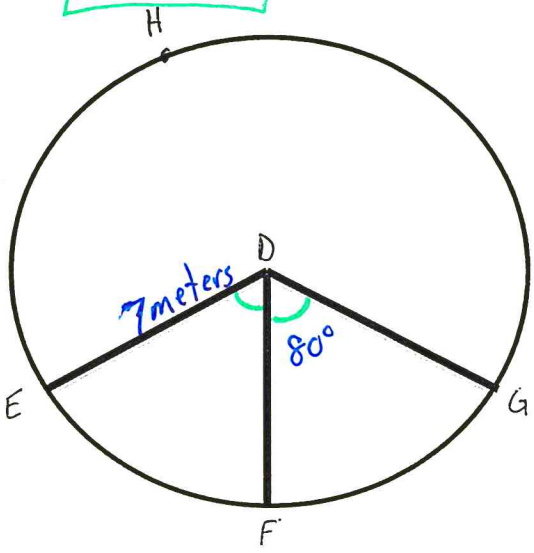
7. The exact circumference of a circle with diameter 15 inches.

$C = \pi d \rightarrow C = \pi(15) \rightarrow C = 15\pi$

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

$C = 2\pi r \rightarrow C = 2\pi(27) \rightarrow C = 54\pi$

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



9. m $\overset{\frown}{EFG}$ $= m\overset{\frown}{FE} + m\overset{\frown}{FG}$
$= 80° + 80°$
$= \boxed{160°}$

10. m $\overset{\frown}{EHG}$ $= 360° - m\overset{\frown}{EFG}$
$= 360° - 160°$
$= \boxed{200°}$

11. Length of $\overset{\frown}{EFG}$
$EFG = \frac{m\overset{\frown}{EFG}}{360} \cdot 2\pi r$
$= \frac{160}{360} \cdot \frac{2\pi(7)}{1}$
$= \frac{2240\pi}{360} = \boxed{\frac{56}{9}\pi}$

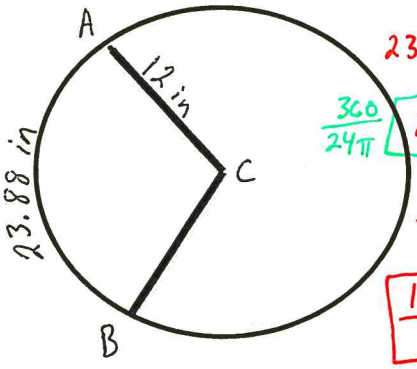
12. Length of $\overset{\frown}{EHG}$
$EHG = \frac{m\overset{\frown}{EHG}}{360} \cdot 2\pi r$
$= \frac{200}{360} \cdot \frac{2\pi(7)}{1}$
$= \frac{2800\pi}{360} = \boxed{\frac{70}{9}\pi}$

13. m $\overset{\frown}{EHF}$
$= m\overset{\frown}{EHG} + m\overset{\frown}{FG}$
$= 200° + 80°$
$= \boxed{280°}$

14. Length of $\overset{\frown}{FEG}$
$FEG = \frac{m\overset{\frown}{FEG}}{360} \cdot 2\pi r$
$= \frac{280}{360} \cdot \frac{2\pi(7)}{1}$
$= \frac{3920\pi}{360} = \boxed{\frac{98}{9}\pi}$

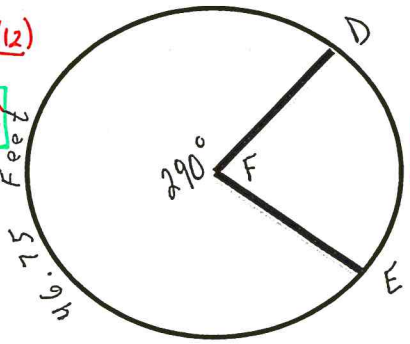
Find the indicated measure:

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



$AB = \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi r$
$23.88 = \frac{m\overset{\frown}{AB}}{360} \cdot \frac{2\pi(12)}{1}$
$\frac{360}{24\pi}$ $23.88 = \frac{24\pi}{360} \cdot m\overset{\frown}{AB}$
$\frac{8596.8}{24\pi} = m\overset{\frown}{AB}$
$\boxed{\frac{1791}{5\pi}} = m\overset{\frown}{AB}$
$\approx 114° \approx m\overset{\frown}{AB}$

16. Circumference of the circle.



$ED_{long} = \frac{m\overset{\frown}{ED}}{360} \cdot 2\pi r$
$ED_{long} = \frac{m\overset{\frown}{ED}}{360} \cdot C$
$\frac{360}{290}$ $46.75 = \frac{290}{360} \cdot C$
$\boxed{\frac{1683}{29}} = C$
$58.0 \approx C$