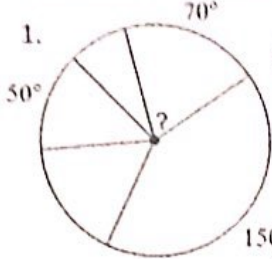
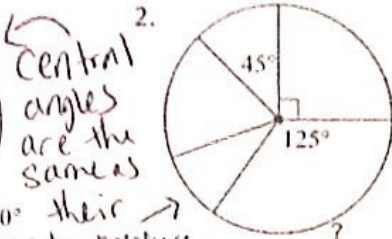


Level Problems:

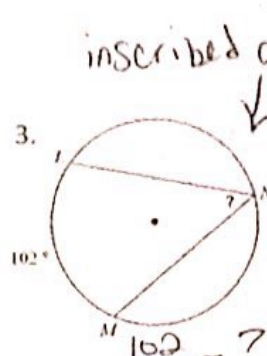
For problems 1-4 find the arc or angle marked by the ?



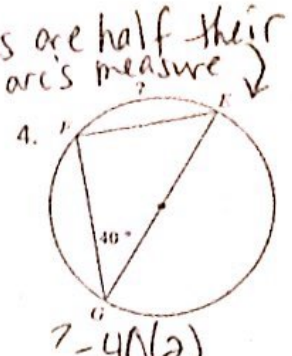
? = 70



? = 125

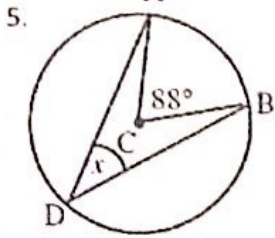


? = 51



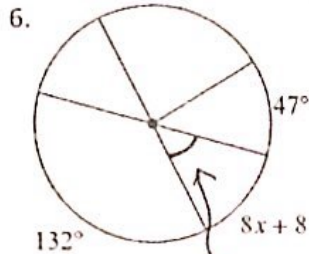
? = 80

For problems 5-12, solve for x



$x = 88 / 2$

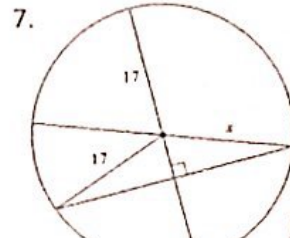
x = 44



$180 - 132 = 48$

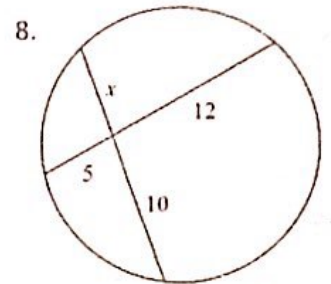
$8x + 8 = 48$
 $-8 \quad -8$
 $8x = 40$
 $\frac{8x}{8} = \frac{40}{8}$

x = 5



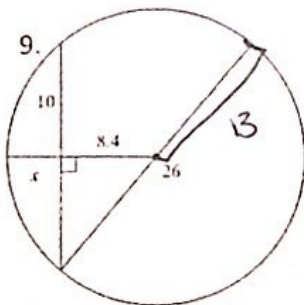
radii are all \cong in a circle

x = 17



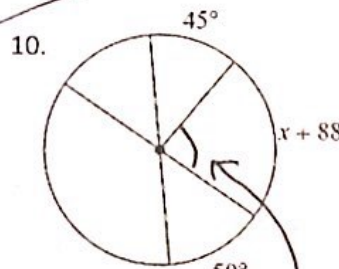
$10 \cdot x = 5 \cdot 12$
 $\frac{10x}{10} = \frac{60}{10}$

x = 6



$x + 8 \cdot 4 = 13$
 $-8 \cdot 4 \quad -8 \cdot 4$
 $x = 4.6$

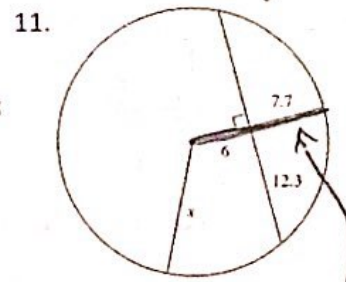
x = 4.6



$45 + 50 = 95$
 $180 - 95 = 85$

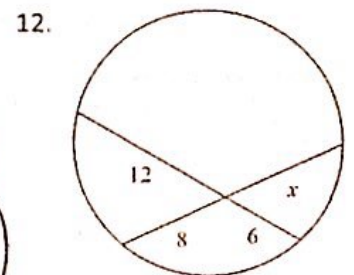
$x + 88 = 85$
 $-88 \quad -88$

x = -3



$6 + 7.7 = 13$

x = 13



$x \cdot 8 = 12 \cdot 6$
 $\frac{8x}{8} = \frac{72}{8}$

x = 9

B Level Problems:

13. In $\odot P$, \overline{AB} is a diameter, $m\angle CPB = 75^\circ$, $\overline{AB} \parallel \overline{EF}$, and $m\angle BAF = 20^\circ$. Find each of the following:

a. $m\widehat{FB} = 2(20) = 40^\circ$

b. $m\widehat{EF} = 180 - 40 - 40 = 100^\circ$

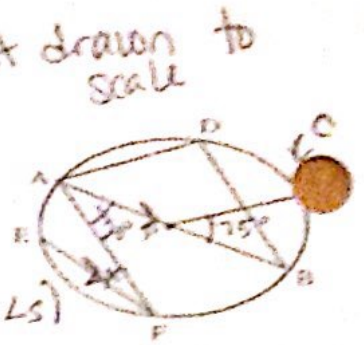
c. $m\widehat{AE} = 2(20) = 40^\circ$

d. $m\angle AFE = 20^\circ$ (alt int \angle s)

e. $m\widehat{BC} = 75^\circ$

f. $m\widehat{ADC} = 180 - 75 = 105^\circ$

g. $m\angle ADB = \frac{180}{2} = 90^\circ$



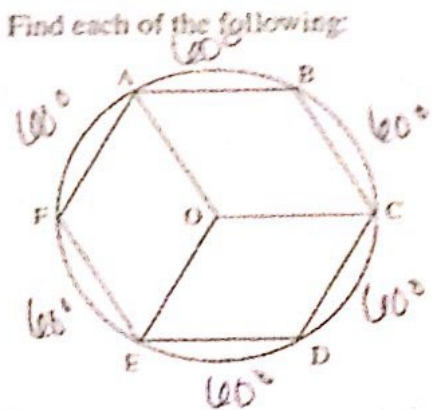
14. Regular hexagon ABCDEF is inscribed in circle O and $AB = 8$ cm. Find each of the following:

a. $m\angle AOC = 120^\circ$

b. $m\widehat{AB} = 60^\circ$

c. $m\widehat{ACE} = 240^\circ$

d. $m\widehat{ABC} = 120^\circ$



15. The diameter of a wheel on Jose's car is 28 inches.

a) How far along the ground does the wheel travel after one rotation?

One rotation = 1 circumference $C = 28\pi \text{ in} \approx$

b) If the wheel rolls 140π inches, how many rotations did it complete? Show your work.

$\frac{140\pi \text{ in}}{28\pi \text{ in}} = 5 \text{ rotations}$

A Level Problems:

16. In $\odot O$, $m\angle EWA = 36^\circ$ and $m\angle WST = 42^\circ$.

a. Find $m\angle WES$. $180 - 36 - 42 = 102^\circ$

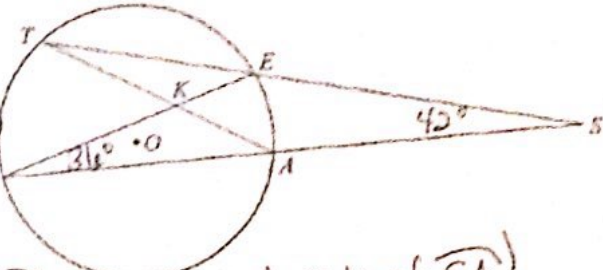
b. Find $m\widehat{TW}$. $\angle WKA = 166^\circ$ (vertical \angle s)

So $\angle KAW = 180 - 166 - 36 = 78^\circ$ & $\widehat{TW} = 78(2) = 156^\circ$

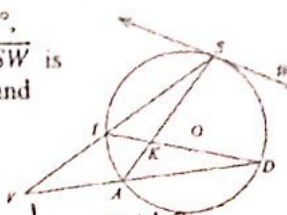
c. Find $m\widehat{EA}$. 120°

d. Find $m\angle TKE$. $\angle KET = 78^\circ$ & $\angle ETK = 36^\circ$ (inscribed angle of \widehat{EA})

So $\angle TKE = 180 - 78 - 36 = 66^\circ$



17. In the figure at right, $m\widehat{SD} = 92^\circ$, $m\widehat{DA} = 103^\circ$, $m\widehat{AI} = 41^\circ$ and \overline{SW} is tangent to $\odot O$. Find $m\angle AKD$ and $m\angle VAS$.



$m\angle AKD$:

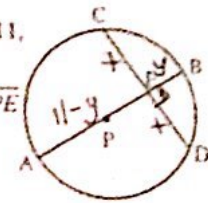
$\angle KAD = \frac{92}{2} = 46^\circ$

$\angle KDA = \frac{41}{2} = 20.5^\circ$

$\angle AKD = 180 - 20.5 - 46 = 113.5^\circ$

$m\angle VAS$
 $\angle KAD = 46^\circ$
 $m\angle VAS = 180 - 46 = 134^\circ$

18. \overline{AB} is a diameter of $\odot P$, $\overline{AB} = 11$, $m\widehat{CB} = 15^\circ$. $\overline{CE} \cong \overline{ED}$. Calculate the lengths of \overline{CE} and \overline{PE} .



$\overline{CE} = \underline{\hspace{2cm}}$ $\overline{PE} = \underline{\hspace{2cm}}$