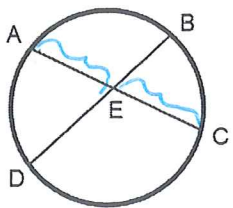


Geometry - 10.7 - Special Segments in a Circle

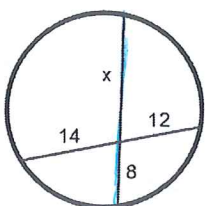
Theorem 10.15



Two chords of a circle intersect...

$$\underline{AE} \cdot \underline{EC} = \underline{DE} \cdot \underline{EB}$$

Ex 1 - Find x.

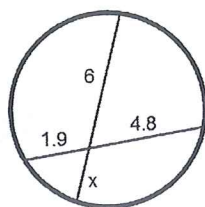


$$8 \cdot x = 14 \cdot 12$$

$$\frac{8x}{8} = \frac{168}{8}$$

$$x = 21$$

Ex 2 - Find x.

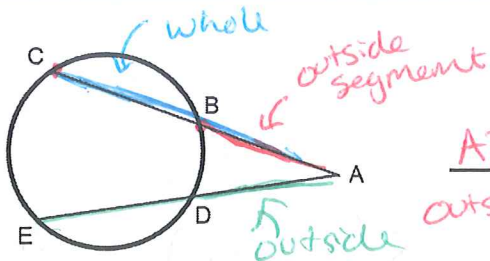


$$6 \cdot x = 1.9 \cdot 4.8$$

$$\frac{6x}{6} = \frac{9.12}{6}$$

$$x = 1.52$$

Theorem 10.16

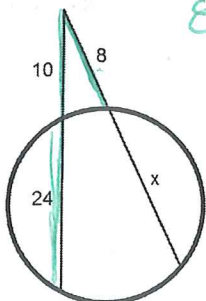


Two secants to an exterior point...

$$\frac{\text{outside}}{\text{whole}} \cdot \frac{\text{whole}}{\text{whole}} = \frac{\text{outside}}{\text{whole}} \cdot \frac{\text{whole}}{\text{whole}}$$

$$\underline{AB} \cdot \underline{AC} = \underline{AD} \cdot \underline{AE}$$

Ex 3 - Find x.



$$8 \cdot (x+8) = 10 \cdot 34$$

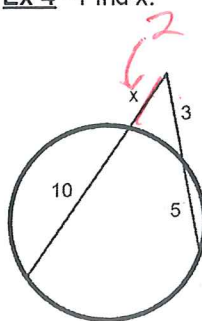
$$8x + 64 = 340$$

$$-64 \quad -64$$

$$\frac{8x}{8} = \frac{276}{8}$$

$$x = 34.5$$

Ex 4 - Find x.



$$x(x+10) = 3 \cdot (3+5)$$

$$x^2 + 10x = 3 \cdot 8$$

$$x^2 + 10x = 24$$

$$-24 \quad -24$$

$$\begin{array}{r} 12 \\ 2 \\ \hline 64 \\ \hline 88 \end{array}$$

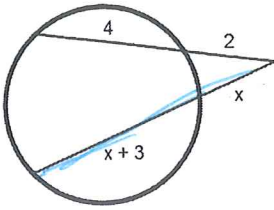
$$x^2 + 10x - 24 = 0$$

$$(x+12)(x-2) = 0$$

$$x+12=0 \quad x-2=0$$

$$x=-12 \quad x=2$$

Ex 5 - Find x.



$$x(x+x+3) = 2(2+4)$$

$$x(2x+3) = 2(6)$$

$$2x^2 + 3x = 12$$

$$-12 \quad -12$$

$$ax^2 + bx + c \quad 2x^2 + 3x - 12 = 0$$

$$a=2 \quad b=3 \quad c=-12$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(2)(-12)}}{2(2)}$$

$$= \frac{-3 \pm \sqrt{9 - 4(-24)}}{4}$$

$$= \frac{-3 \pm \sqrt{9 + 96}}{4}$$

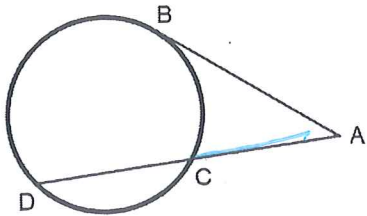
$$= \frac{-3 \pm \sqrt{105}}{4}$$

$$\frac{-3 - \sqrt{105}}{4} = \frac{-3 - 10.25}{4} = \frac{-13.25}{4} = -3.31$$

$$\frac{-3 + \sqrt{105}}{4} = \frac{-3 + 10.25}{4} = \frac{7.25}{4} = 1.81$$

Theorem 10.17

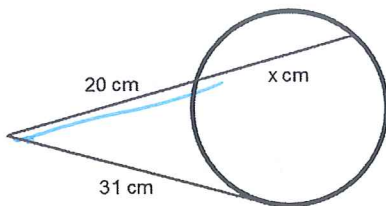
A tangent and a secant to an exterior point...



$$\frac{AC}{\text{outside}} \cdot \frac{AD}{\text{whole}} = \frac{AB}{\text{whole}} \cdot \frac{AB}{\text{whole}}$$

Equivalently: $AC \cdot AD = AB^2$

Ex 6 - Find x.



$$26(20+x) = 31 \cdot 31$$

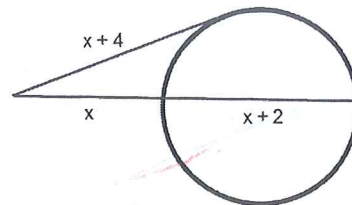
$$400 + 20x = 961$$

$$-400 \quad -400$$

$$\frac{20x}{20} = \frac{561}{20}$$

$$x = 28.05$$

Ex 7 - Find x.



FOIL

$$x(x+x+2) = (x+4)(x+4)$$

$$x(2x+2) = x^2 + 4x + 4x + 16$$

$$2x^2 + 2x = x^2 + 8x + 16$$

$$-x^2 \quad -8x \quad -16 = x^2 - 8x + 16$$

$$x^2 - 6x - 16 = 0 \quad 82$$

$$(x - 8)(x + 2) = 0$$

$$x - 8 = 0$$

$$x + 2 = 0$$

$$x = 8$$

$$x = -2$$