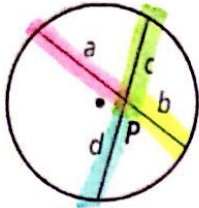


GUIDED NOTES: Lengths Formed By Secants, Tangents, and Chords

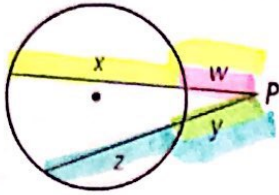
Theorem:

For a given point and circle, the product of the lengths of the two segments from the point to the circle is constant along any line through the point and the circle.



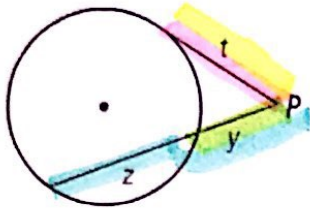
$$a \cdot b = c \cdot d$$

one side · other side = one side · other side
 chord 1 chord 2



$$(w + x)w = (y + z)y$$

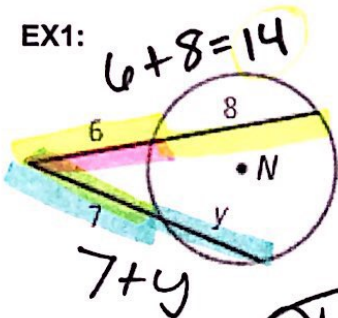
outside · whole = outside · whole
 chord 1/top chord 2/bottom



$$(y + z)y = t^2$$

outside · whole = outside · whole
 chord 1/top chord 2/bottom

EX1:



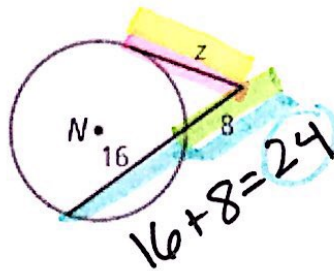
$$6(14) = 7(7 + y)$$

$$84 = 49 + 7y$$

$$\frac{35}{7} = \frac{7y}{7}$$

$$y = 5$$

EX2:

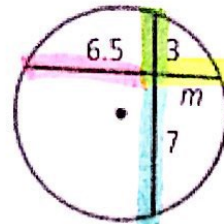


$$z \cdot z = 8(24)$$

$$\sqrt{z^2} = \sqrt{192}$$

$$z = 13.86$$

EX3:

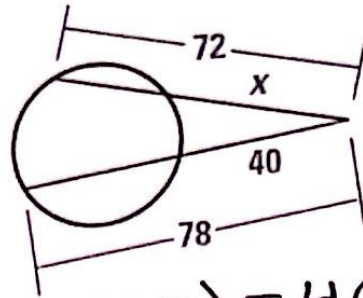


$$6.5(m) = 3(7)$$

$$\frac{6.5m}{6.5} = \frac{21}{6.5}$$

$$m = 3.23$$

EX5:

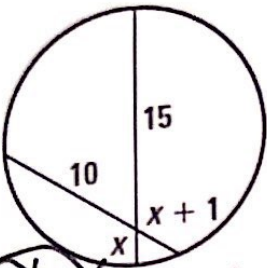


$$x(72) = 40(78)$$

$$\frac{72x}{72} = \frac{3120}{72}$$

$$x = 43.33$$

EX4:



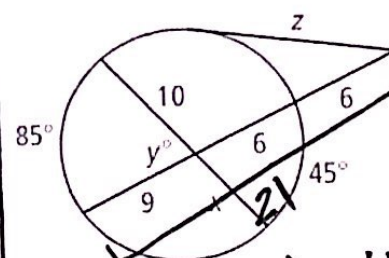
$$10(x+1) = 15x$$

$$\begin{array}{r} 10x + 10 = 15x \\ -10x \quad -10x \\ \hline \end{array}$$

$$\frac{10}{5} = \frac{5x}{5}$$

$$x = 2$$

EX7:



$$10x = 9(6)$$

$$\frac{10x}{10} = \frac{54}{10}$$

$$x = 5.4$$

$$z \cdot z = 6(21)$$

$$z^2 = \sqrt{126}$$

$$z = 11.22$$

$$y = \frac{1}{2}(85 + 45)$$

$$y = 65^\circ$$

* Quadratic formula
or
factor

$$-64x^2$$

$$-4x^2 + 16x = 12x$$

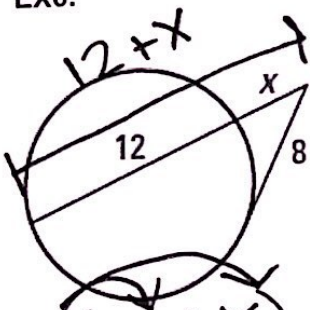
$$x - 4 = 0$$

$$x = 4$$

$$x + 16 = 0$$

$$x = -16$$

EX6:



$$x(12+x) = 8(8)$$

$$\begin{array}{r} 12x + x^2 = 64 \\ -64 \quad -64 \\ \hline \end{array}$$

$$x^2 + 12x - 64 = 0$$

$$\frac{x^2}{x} - \frac{4x}{x} + \frac{16x}{16} - \frac{64}{16} = 0$$

$$x(x-4) + 16(x-4) = 0$$

$$(x-4)(x+16) = 0$$