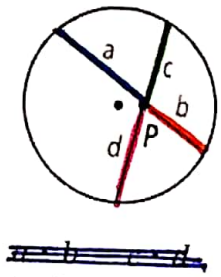
April 5

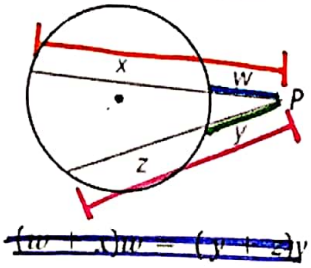
GUIDED NOTES: Lengths Formed By Secants, Tangents, and Chords

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.

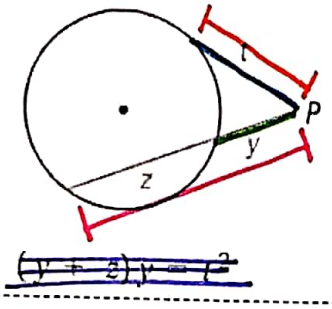


piece • other piece = piece • other piece



outside • whole length = outside • whole length

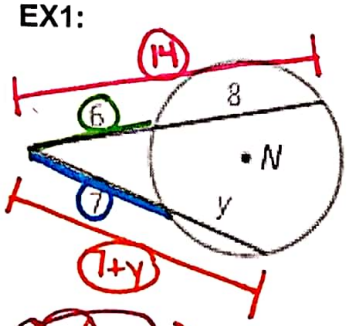
(add to get the whole length)



outside • whole length = outside • whole length

(same on a tangent)

EX1:



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

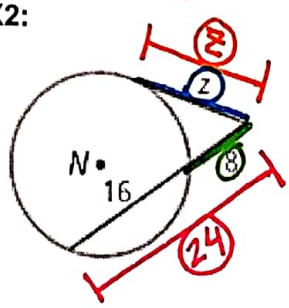
$49 + 7y = 84$

$-49 \quad -49$

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

$y = 5$

EX2:

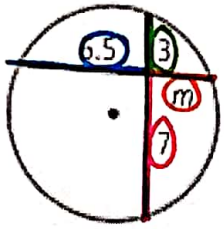


$z \cdot z = 8 \cdot 24$

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

$z = 13.86$

EX3:



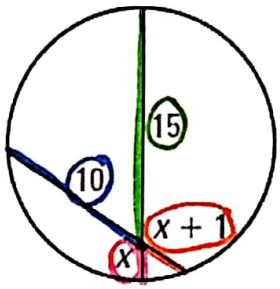
$6.5 \cdot m = 3 \cdot 7$

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

$m = 3.23$

Scanned by CamScanner

EX4:



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

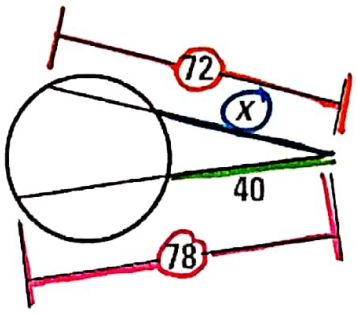
$10x + 10 = 15x$

$-10x \quad -10x$

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

$\boxed{2 = x}$

EX5:

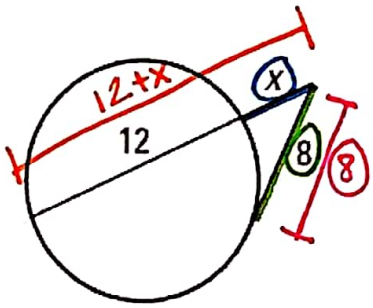


$x \cdot 72 = 40 \cdot 78$

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

$\boxed{x = 43.33}$

EX6:



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

$12x + x^2 = 64$

$-64 \quad -64$

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

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

$a: 1 \quad b: 12 \quad c: -64$

$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(-64)}}{2(1)}$

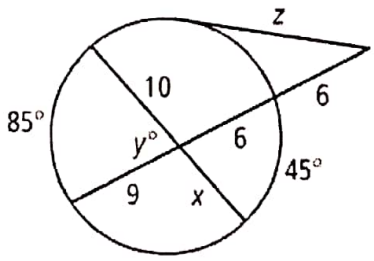
$x = \frac{-12 \pm \sqrt{400}}{2}$

$x = \frac{-12 \pm 20}{2}$

$x = 4, -16$ ← no negative lengths!

$\boxed{x = 4}$

EX7:



Scanned by CamScanner