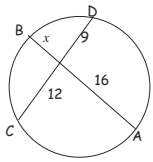


[Example 1: Find the value of x.]

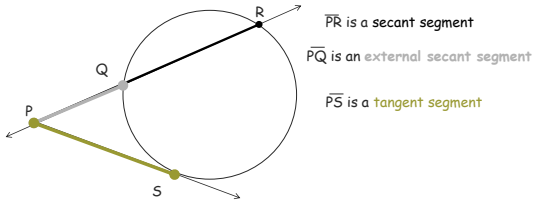


$$16x = 9 \cdot 12$$

$$\frac{16x}{16} = \frac{108}{16}$$

$$x = \frac{27}{4}$$

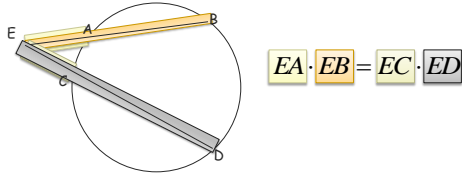
[Definitions]



PR is a secant segment
 PQ is an external secant segment
 PS is a tangent segment

[Theorem]

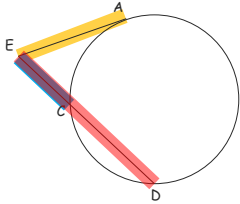
For any 2 secant segments that share an external endpoint, the product of the external secant segments and their corresponding secant segments are equal.



$$EA \cdot EB = EC \cdot ED$$

Theorem

For any secant segment and tangent segment that intersect outside a circle...



$$(EA)^2 = EC \cdot ED$$

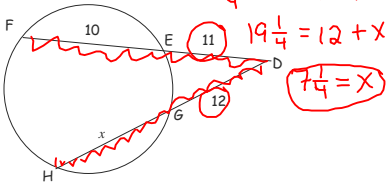
Example 2

Find the value of x.

$$11(21) = 12(12+x)$$

$$\frac{11 \cdot 21}{124} = \frac{12(12+x)}{12}$$

$$\frac{231}{4} = 12 + x$$



$$\frac{231}{4} = x$$

Check Point

Find the values of x and y (leave as a mixed number where necessary).

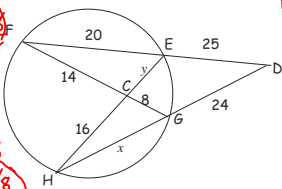
$$\frac{375}{24} = \frac{15}{8}$$

$$24(x+24) = 25(24)$$

$$x+24 = \frac{375}{8}$$

$$x+24 = 46 \frac{7}{8}$$

$$x = 22 \frac{7}{8}$$



$$\frac{16y}{16} = \frac{14 \cdot 24}{16}$$

$$y = 7$$

Example 3

Find the value of x .

$30^2 = x(x+24)$
 $900 = x^2 + 24x - 900$
 -900
 $0 = x^2 + 24x - 900$
 $0 = (x+60)(x-15)$

30
 60
 20

30
 15
 45

On your own...

Find the value of x .

