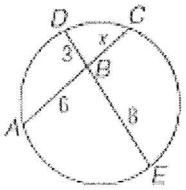
Name: Key

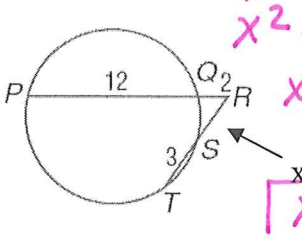
# Homework #1! Special Segments 10-7

**Directions:** Complete the following questions to **find the variables** using the conjectures we have discovered in chapter 10.

1. 


$3 \cdot 8 = 6x$

$\boxed{4 = x}$

2. 

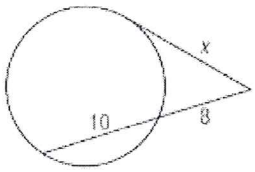

$x(x+3) = 2(14)$

$x^2 + 3x = 28$

$x^2 + 3x - 28 = 0$

$(x-4)(x+7) = 0$

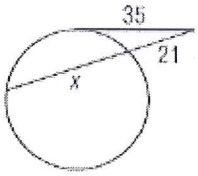
$\boxed{x = 4}$ NOT $x = -7$

3. 


$x^2 = 8 \cdot 18$

$x^2 = 144$

$\boxed{x = 12}$

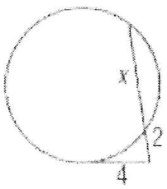
4. 


$35^2 = 21(21+x)$

$1225 = 441 + 21x$

$784 = 21x$

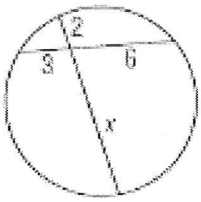
$\boxed{x = 37.3 \text{ or } \frac{112}{3}}$

5. 


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

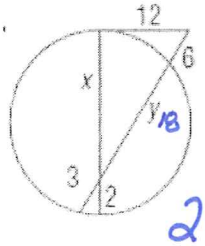
$16 = 4 + 2x$

$\boxed{6 = x}$

6. 


$2x = 18$

$\boxed{x = 9}$

7. 


Find y 1st :

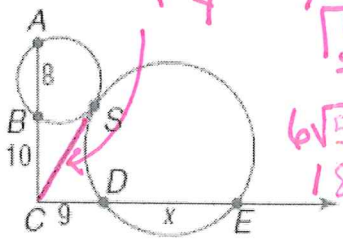
$12^2 = 6(6+y)$

$144 = 36 + 6y$

$\boxed{18 = y}$

$2x = 3 \cdot 18$

$\boxed{x = 27}$

8. 


Find 1st y

$y^2 = 10 \cdot 18$

$\boxed{y = 6\sqrt{5}}$

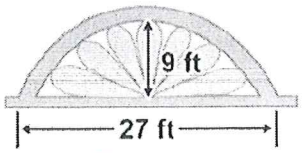
$(6\sqrt{5})^2 = 9(9+x)$

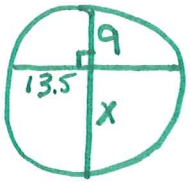
$180 = 81 + 9x$

$99 = 9x$

$\boxed{11 = x}$

**7. Jason is designing an entrance to a school. There is an arched window above the entrance. What is the diameter of the circle containing the arc if the window is not a semicircle?**




$9x = 13.5 \times 13.5$

$9x = 182.25$

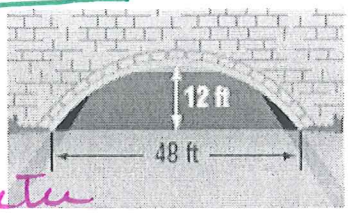
$x = 20.25\text{ft}$

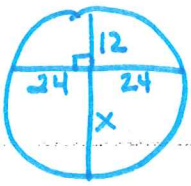
Radius = $\frac{1}{2}$ diameter

$9 + 20.25 =$ diameter

$\therefore R = 14.625\text{ft}$

**8.** TUNNELS Tunnels are constructed to allow roadways to pass through mountains. What is the radius of the circle containing the arc if the opening is not a semicircle?




$12x = 24.24$

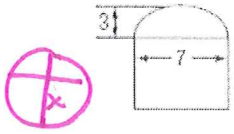
$x = 48$

$12 + 48 =$ diameter

$\therefore \frac{1}{2}60 =$ radius

Radius = 30ft

**9.** HISTORY The Roman Coliseum has many "entrances" in the shape of a door with an arched top. The ratio of the arch width to the arch height is 7:3. Find the ratio of the arch width to the radius of the circle that contains the arch.




Find Radius

$3x = 3.5 \cdot 3.5$

$3x = 12.25$

$x = 4.08\overline{3}$

$+ 3$

$d = 7.08\overline{3}$

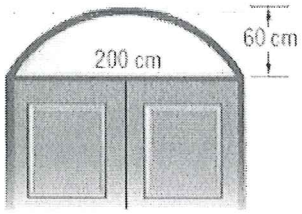
$d = 7.08\overline{3} \div 2 =$ Radius

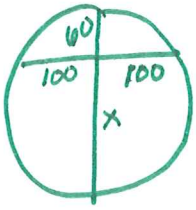
$r = 3.5$

Ratio = Width to Radius

7 : 3.5 or 7 to 3.5

**10.** ARCHITECTURE An arch over a courtroom door is 60 centimeters high and 200 centimeters wide. Find the radius of the circle containing the arc of the arch.



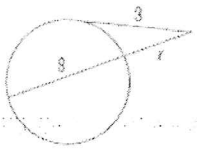

$60x = 100^2$

$x = 166.\overline{6}\text{ cm}$

$d = 226.\overline{6}\text{ cm}$

$r = 113.\overline{3}\text{ cm}$

**11.** FIND THE ERROR Becky and Latisha are writing products to find $x$. Who is correct? Explain your reasoning.




Becky ✗

$3^2 = x \cdot 8$

$9 = 8x$

$\frac{9}{8} = x$

Latisha ☺

$3^2 = x(x + 8)$

$9 = x^2 + 8x$

$0 = x^2 + 8x - 9$

$0 = (x + 9)(x - 1)$

$x = 1$