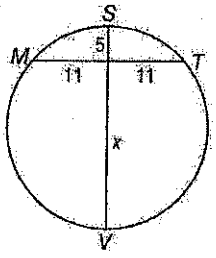
NAME _____ DATE _____ PERIOD _____

10-7 Practice

Special Segments in a Circle

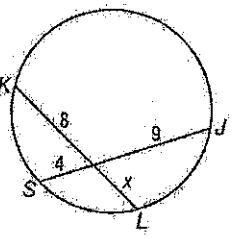
Find x. Assume that segments that appear to be tangent are tangent. Round to the nearest tenth if necessary.

1. 

$11(11) = 5(x)$

$121 = 5x$

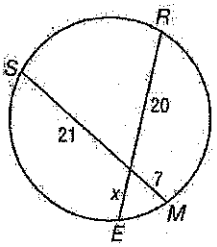
$24.2 = x$

2. 

$8(x) = 4(9)$

$8x = 36$

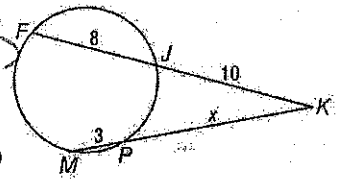
$x = 4.5$

3. 

$21(7) = 20(x)$

$147 = 20x$

$7.35 = x$

4. 

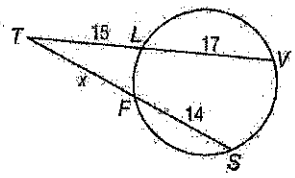
$10(18) = x(x+3)$

$180 = x^2 + 3x$

$0 = x^2 + 3x - 180$

$0 = (x+15)(x-12)$

$x = -15$ $\quad x = 12$

5. 

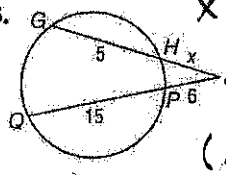
$15(32) = x(x+14)$

$480 = x^2 + 14x$

$0 = x^2 + 14x - 480$

$0 = (x+30)(x-16)$

$x = -30$ $\quad x = 16$

6. 

$x(x+5) = 6(21)$

$x^2 + 5x = 126$

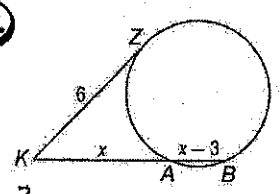
$x^2 + 5x - 126 = 0$

$(x+14)(x-9) = 0$

$x = -14$ $\quad x = 9$

$b^2 - 4ac$

$(5)^2 - 4(1)(-126)$

7. 

$6^2 = x(2x-3)$

$36 = 2x^2 - 3x$

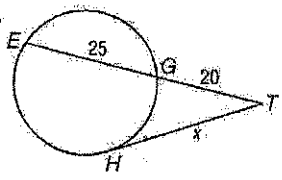
$0 = 2x^2 - 3x - 36$

$b^2 - 4ac$

$(-3)^2 - 4(2)(-36)$

297

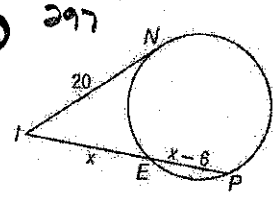
$\frac{3 \pm \sqrt{297}}{4} = 5.06$

8. 

$x^2 = 20(45)$

$x^2 = 900$

$x = 30$

9. 

$20^2 = x(2x-6)$

$400 = 2x^2 - 6x$

$0 = 2x^2 - 6x - 400$

$0 = 2(x^2 - 3x - 200)$

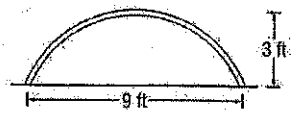
$b^2 - 4ac$

$(-3)^2 - 4(1)(-200)$

809

$\frac{3 \pm \sqrt{809}}{2} = 15.72$

10. **CONSTRUCTION** An arch over an apartment entrance is 3 feet high and 9 feet wide. Find the radius of the circle containing the arc of the arch.



72

3

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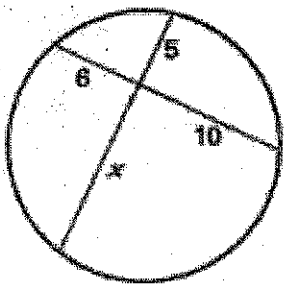
10 – 7 Practice

Special Segments in Circles Continued

10.

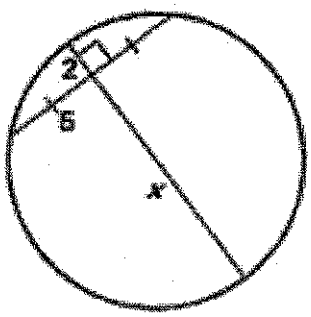


$6(10) = x(5)$

$60 = 5x$

$\boxed{12 = x}$

11.

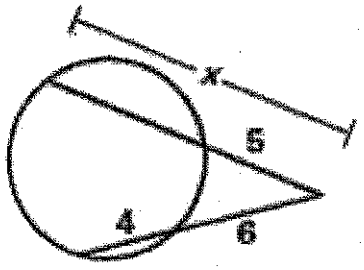


$5(5) = 2(x)$

$25 = 2x$

$\boxed{12.5 = x}$

12.

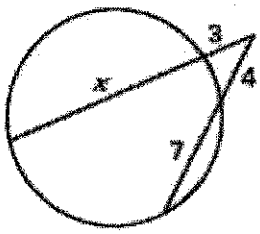


$5(x) = 6(10)$

$5x = 60$

$\boxed{x = 12}$

13.



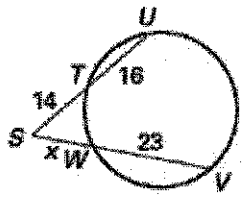
$3(3+x) = 4(11)$

$9 + 3x = 44$

$3x = 35$

$\boxed{x = 11.67}$

14.



$x(x+23) = 14(30)$

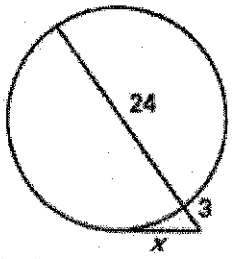
$x^2 + 23x = 420$

$x^2 + 23x - 420 = 0$

$(x+35)(x-12) = 0$

$x = -35$ $\boxed{x = 12}$

15.

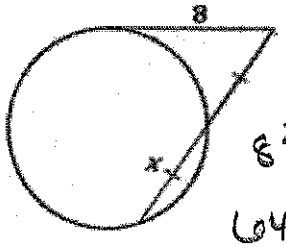


$y^2 = 3(27)$

$x^2 = 81$

$\boxed{x = 9}$

16.



$8^2 = x(2x)$

$64 = 2x^2$

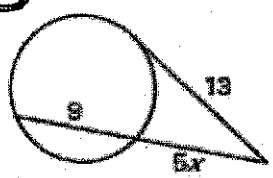
$32 = x^2$

$16 \quad 2$

$\boxed{4\sqrt{2} = x}$

$5.66 \approx x$

17.



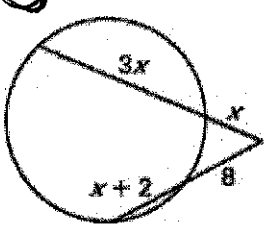
$13^2 = 5x(5x+9)$

$169 = 25x^2 + 45x$

$25x^2 + 45x - 169 = 0$

$\frac{-45 + \sqrt{18225}}{50} = \boxed{0.304}$

18.



$x(4x) = 8(x+10)$

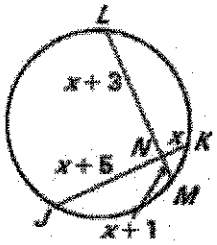
$4x^2 = 8x + 80$

$4x^2 - 8x - 80 = 0$

$4(x^2 - 2x - 20) = 0$

$\frac{2 + \sqrt{84}}{2} = \boxed{5.58}$

19.

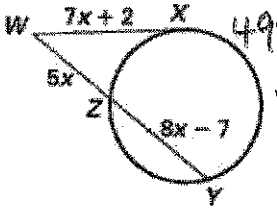


$x(x+5) = (x+3)(x+1)$

$x^2 + 5x = x^2 + 4x + 3$

$\boxed{x = 3}$

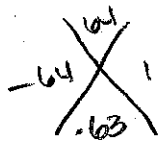
20.



$(7x+2)^2 = 5x(9x-7)$

$49x^2 + 28x + 4 = 65x^2 - 35x$

$16x^2 - 63x - 4 = 0$



$16x^2 - 64x + x - 4$

$16x(x-4) + 1(x-4) = 0$

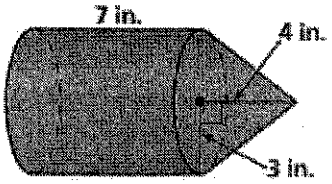
$(16x+1)(x-4)$

$x = -1/16$ $\boxed{x = 4}$

Volume Practice

Directions: Find the total volume of each figure. Round to the nearest hundredth.

21.

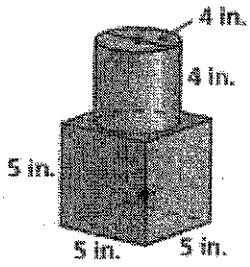


Cylinder = Bh
$= \pi(3)^2(7)$
$= \pi(9)(7)$
$= 63\pi \text{ in}^3$

Cone = $\frac{1}{3}Bh$
$= \frac{1}{3}\pi(3)^2(4)$
$= \frac{1}{3}\pi(9)(4)$
$= \frac{36}{3}\pi$
$= 12\pi \text{ in}^3$

$75\pi \text{ in}^3$

22.

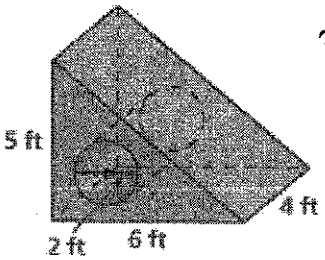


Cylinder = Bh
$= \pi(2)^2(4)$
$= \pi(4)(4)$
$= 16\pi \text{ in}^3$

Prism = Bh
$= 5(5)(5)$
$= 25(5)$
$= 125 \text{ in}^3$

$16\pi + 125 \approx$ **175.27 in³**

23.

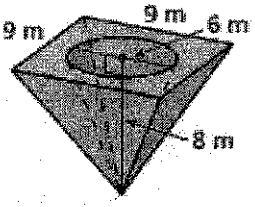


Prism = Bh
$= \frac{1}{2}(5)(6)(4)$
$= \frac{1}{2}(30)(4)$
$= 15(4)$
$= 60 \text{ ft}^3$

Cylinder = Bh
$= \pi(1)^2(4)$
$= 4\pi \text{ ft}^3$

$60 - 4\pi \approx$ **47.43 ft³**

24.



Pyramid = $\frac{1}{3}Bh$
$= \frac{1}{3}(9)(9)(8)$
$= \frac{1}{3}(81)(8)$
$= \frac{1}{3}(648)$
$= 216 \text{ m}^3$

Cone = $\frac{1}{3}Bh$
$= \frac{1}{3}\pi(3)^2(8)$
$= \frac{1}{3}\pi(9)(8)$
$= \frac{72}{3}\pi$
$= 24\pi \text{ m}^3$

$216\text{m}^3 - 24\pi\text{m}^3 =$ **140.60 m³**