Name: __Key__

Date: _____ Period: ____

Find the value of the variable(s).

1.

142°   218°

$x = \frac{1}{2}(218 - 142)$ $\boxed{x = 38}$

$x = \frac{1}{2}(76)$

2.

56°

29°

$29 = \frac{1}{2}(x - 56)$ $57 = 0.5x$

$29 = 0.5x - 28$ $\boxed{x = 114°}$

3.

198°

34°
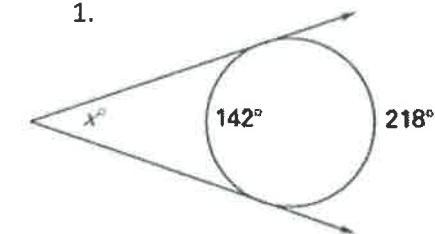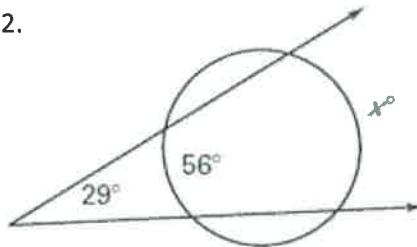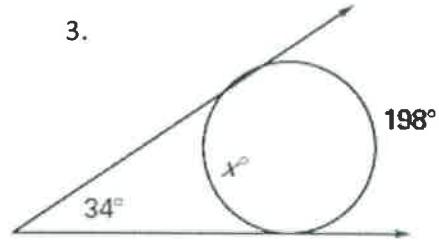
$34 = \frac{1}{2}(198 - x)$

$34 = 99 - 0.5x$

$-65 = -0.5x$

$\boxed{x = 130}$

4.

360 - 247 = 113

247°

113

$x = \frac{1}{2}(247 - 113)$ $\boxed{x = 67}$

$x = \frac{1}{2}(134)$

5.

A   40°
$7x°$
E $3x°$ B
C
D
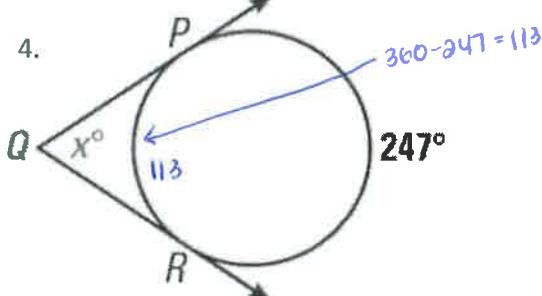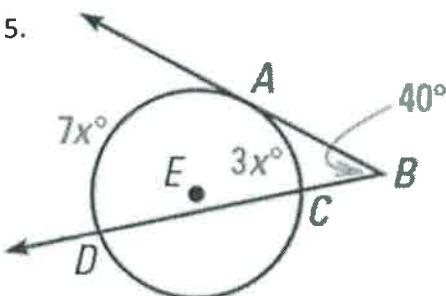
$40 = \frac{1}{2}(7x - 3x)$

$40 = \frac{1}{2}(4x)$

$40 = 2x$

$\boxed{x = 20}$

6.

34° T   U
S
$(x + 6)°$ $(3x - 2)°$
W
V
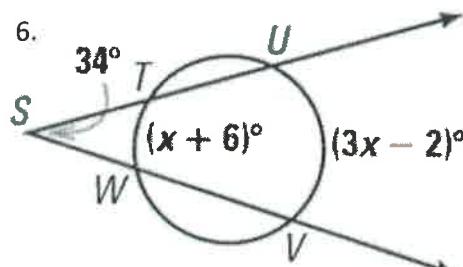
$34 = \frac{1}{2}(3x - 2 - \overparen{(x+6)})$

$34 = \frac{1}{2}(3x - 2 - x - 6)$

$34 = \frac{1}{2}(2x - 8)$

$34 = x - 4$

$\boxed{38 = x}$

7.
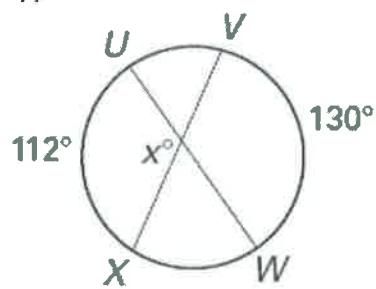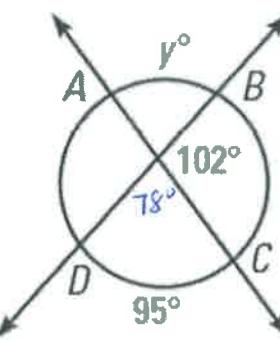
$x = \frac{1}{2}(112+130)$ → $\boxed{x = 121}$

$x = \frac{1}{2}(242)$

8.

$78 = \frac{1}{2}(y+95)$ → $30.5 = 0.5y$

$78 = 0.5y + 47.5$ → $\boxed{y = 61}$

9.

$(6)(x) = (9)(12)$ → $\boxed{x = 18}$

$6x = 108$

10.

$8(8+6) = 7(7+x)$ → $112 = 49 + 7x$

$8(14) = 49 + 7x$ → $63 = 7x$

$\boxed{x = 9}$

11.

$(12)(12) = 9(9+x)$ → $63 = 9x$

$144 = 81 + 9x$ → $\boxed{x = 7}$

12.

$(9)(x-3) = (10)(18)$

$9x - 27 = 180$

$9x = 207$

$\boxed{x = 23}$
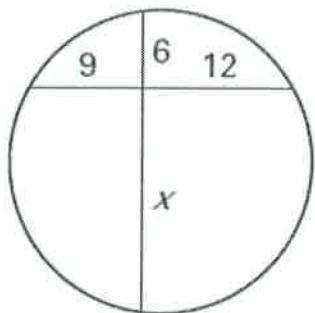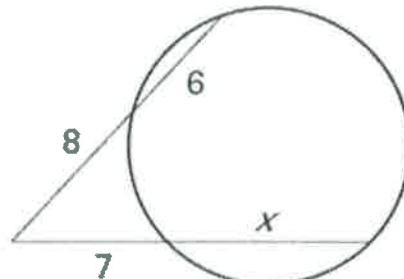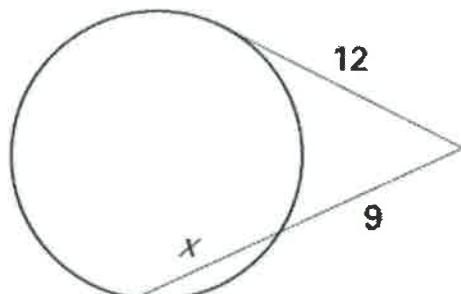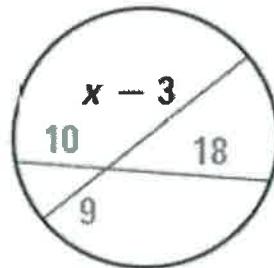
13.
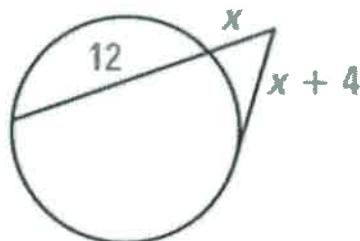
$x(x+12) = (x+4)(x+4)$ ← FOIL

$x^2 + 12x = x^2 + 8x + 16$

$12x = 8x + 16$

$4x = 16$

$\boxed{x = 4}$

14. Describe and correct the error in finding CD.

$CD \cdot DF = AB \cdot AF$
$CD \cdot 4 = 5 \cdot 3$
$CD \cdot 4 = 15$
$CD = 3.75$

F 3 A 5
B
4
D x
C
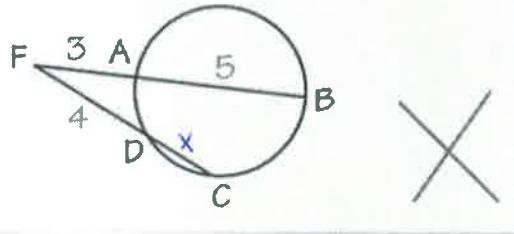
$AF(FB) = FD(FC)$
$3(8) = 4(x+4)$
$24 = 4x + 16$
$8 = 4x$
$\boxed{x = 2} \Rightarrow \boxed{CD = 2}$

15. Find the indicated arc or angle measure:

a) $m\overset{\frown}{AB}$

B
65°
A   t

$m\overset{\frown}{AB} = 65(2) = \boxed{130°}$

b) $m\angle 1$
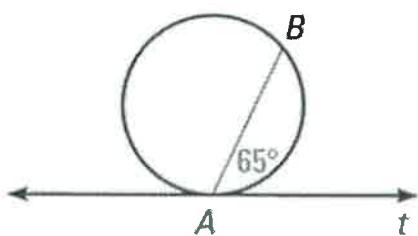
t
260°
1

$m\angle 1 = \frac{1}{2}(260) = \boxed{130°}$

16. The Xs show the positions of two basketball teammates relative to the circle 'key' on a basketball court. The player outside the key passes the ball to the player on the key. To the nearest tenth of a foot, how long is the pass?

5 ft 6 ft
12 ft

$5(5+12) = 6\overset{\frown}{(6+x)}$
$5(17) = 36 + 6x$
$85 = 36 + 6x$
$49 = 6x$
$x = 8.2$

$Pass = 8.2 + 6 = \boxed{14.2 \text{ ft}}$
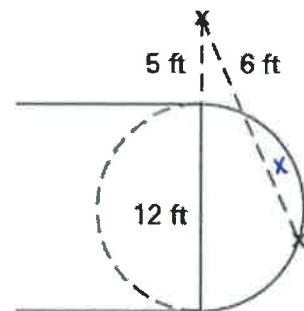
17. The circular stone mound in Ireland called Newgrange has a diameter of 250 feet. A passage 62 feet long leads toward the center of the mound. Find the perpendicular distance x from the end of the passage to either side of the mound.

$\begin{matrix}250-62\\=188\end{matrix}$ 250 ft
x   x
62 ft
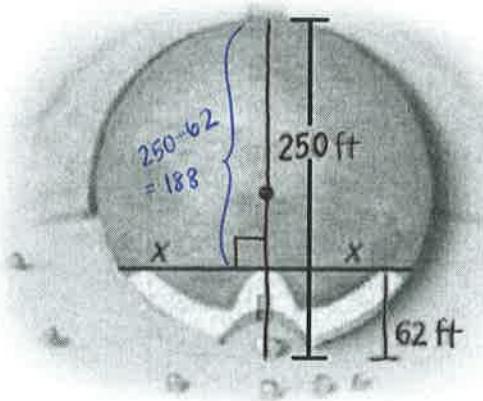
$(x)(x) = (62)(188)$
$x^2 = 11656$
$x = 107.96 \approx \boxed{108 \text{ ft}}$