9-7

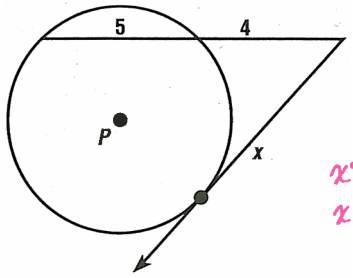
NAME _____ DATE Key

Practice Worksheet

Special Segments in a Circle

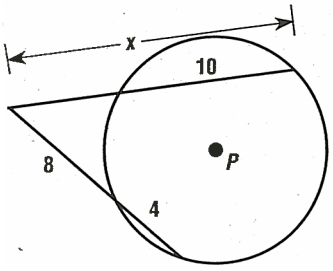
In ⊙P, find the value of x.

1.



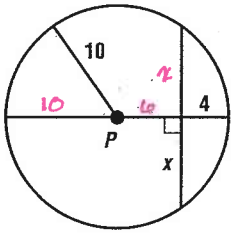
$x^2 = 4(9)$
$x^2 = 36$
$x = 6$

2.



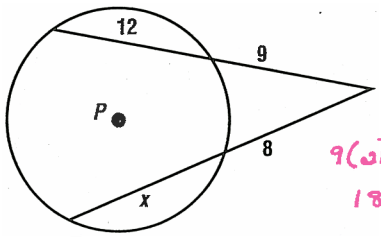
$8(18) = (x-10)x$
$96 = x^2 - 10x$
$x^2 - 10x - 96 = 0$
$(x-16)(x+6) = 0$
$x = 16, \cancel{-6}$

3.



$x^2 = 16(4)$
$x^2 = 64$
$x = 8$

4.



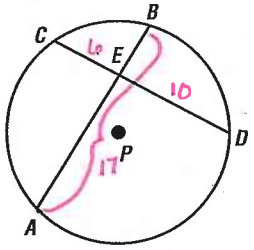
$9(21) = 8(8+x)$
$189 = 64 + 8x$
$125 = 8x$
$x = 15.625$

In ⊙P, CE = 6, CD = 16, and AB = 17. Find each of the following.

5. *EB*

$6(10) = x(17-x)$
$60 = 17x - x^2$
$x^2 - 17x + 60 = 0$

6. *AE*



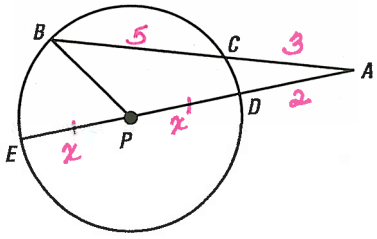
In ⊙P, AC = 3, BC = 5, and AD = 2. Find each of the following.

7. *PD*

$3(8) = 2(2+2x)$
$24 = 4 + 4x$
$20 = 4x$
$x = 5$

8. *ED*

$= 2(5) = 10$



9. *PB*

$= 5$

Name _____ Date _____

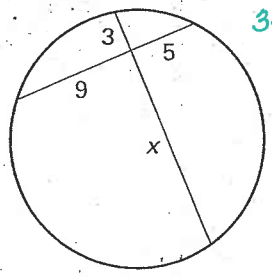
LESSON 10.6

Practice A

For use with pages 688–695

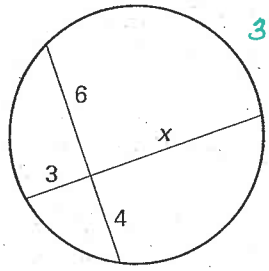
Fill in the blanks. Then find the value of x.

1. $x \cdot \underline{3} = 5 \cdot \underline{9}$



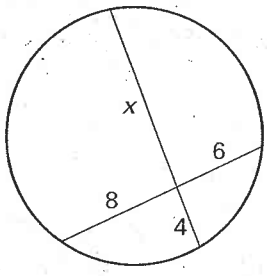
$3x = 45$
$x = 15$

2. $6 \cdot \underline{4} = 3 \cdot \underline{x}$



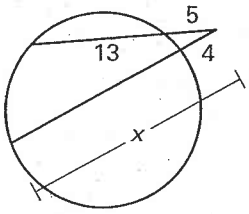
$3x = 24$
$x = 8$

3. $x \cdot \underline{4} = 8 \cdot \underline{6}$



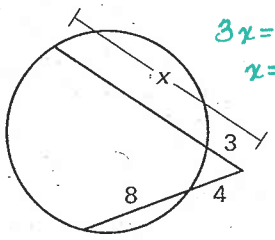
$4x = 48$
$x = 12$

4. $4 \cdot \underline{x} = 5 \cdot \underline{18}$



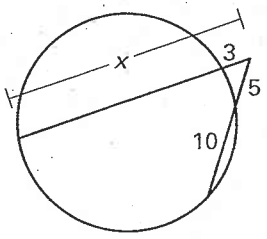
$4x = 90$
$x = 22.5$

5. $3 \cdot \underline{x} = 4 \cdot \underline{12}$



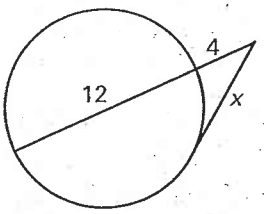
$3x = 48$
$x = 16$

6. $3 \cdot \underline{x} = 5 \cdot \underline{15}$



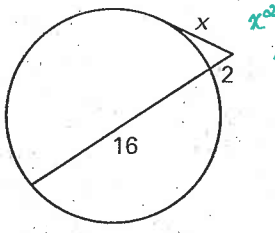
$3x = 75$
$x = 25$

7. $x^2 = 4 \cdot \underline{16}$



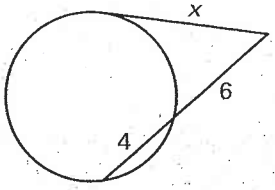
$x^2 = 64$
$x = 8$

8. $x^2 = 2 \cdot \underline{18}$



$x^2 = 36$
$x = 6$

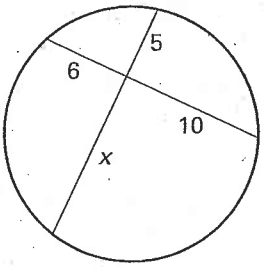
9. $x^2 = 6 \cdot \underline{10}$



$x^2 = 60$
$x = \sqrt{60} = 2\sqrt{15}$

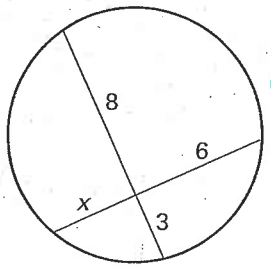
In Exercises 10–24, find the value of x.

10.



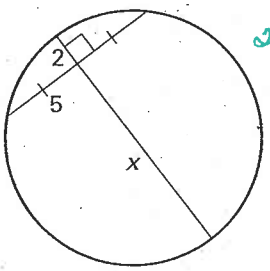
$5x = 60$
$x = 12$

11.



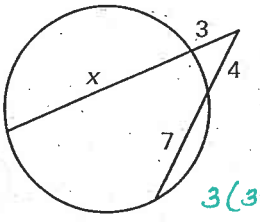
$6x = 24$
$x = 4$

12.



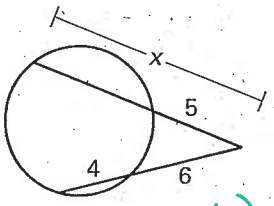
$2x = 25$
$x = 12.5$

13.



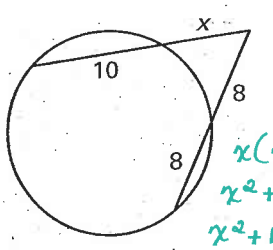
$3(3+x) = 4(11)$
$9 + 3x = 44$
$3x = 35$
$x = 35/3$

14.



$5x = 6(10)$
$5x = 60$
$x = 12$

15.



$x(x+10) = 8(16)$
$x^2 + 10x = 128$
$x^2 + 10x - 128 = 0$
Need Quadratic Formula

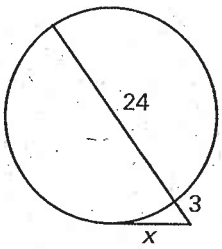
Name _____ Date _____

LESSON 10.6

Practice A *continued*

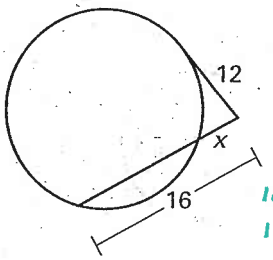
For use with pages 688–695

16.



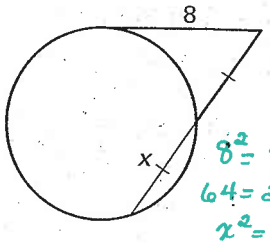
$x^2 = 3(27)$
$x^2 = 81$
$x = 9$

17.



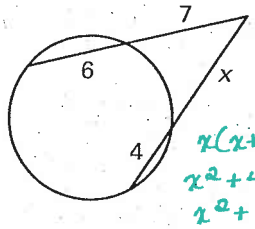
$12^2 = x(16)$
$144 = 16x$
$x = 9$

18.



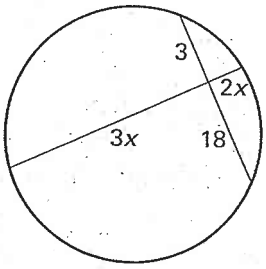
$8^2 = x(2x)$
$64 = 2x^2$
$x^2 = 32$
$x = 4\sqrt{2}$

19.



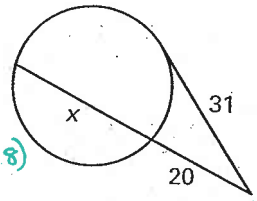
$x(x+4) = 7(13)$
$x^2 + 4x = 91$
$x^2 + 4x - 91 = 0$
Need Quadratic Formula

20.



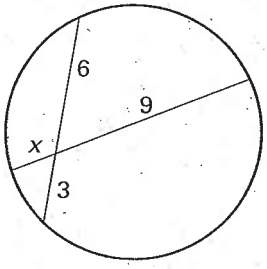
$2x(3x) = 3(18)$
$6x^2 = 54$
$x^2 = 9$
$x = 3$

21.



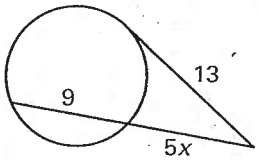
$31^2 = 20(20+x)$
$961 = 400 + 20x$
$561 = 20x$
$x = 28.05$

22.



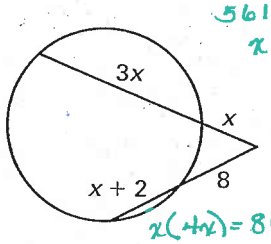
$9x = 18$
$x = 2$

23.



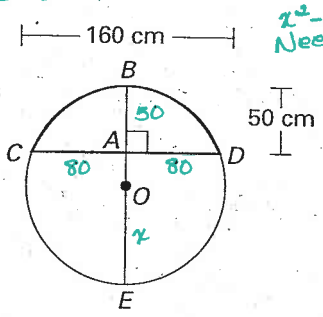
$13^2 = 5x(5x+9)$
$169 = 25x^2 + 45x$
$25x^2 + 45x - 169 = 0$
Need Quadratic Formula

24.



$x(4x) = 8(x+10)$
$4x^2 = 8x + 80$
$4x^2 - 8x - 80 = 0$
$x^2 - 2x - 20 = 0$
Need Quadratic Formula

25. Doorway An arch over a doorway is an arc that is 160 centimeters wide and 50 centimeters high. You are curious about the size of the entire circle. By drawing and labeling a circle passing through the arc as shown in the diagram, you can use the following steps to find the radius of the circle.



a. Find AB. 50

b. Find AC and AD. 80

c. Use AB, AC, and AD to find EA. 128

d. Find EB. 178

e. Find the length of the radius, EO. 89

$50x = 6400$
$x = 128$

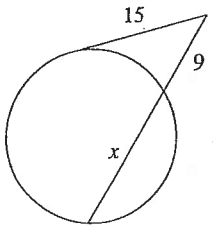
Name Key

Segment Lengths in Circles

Date_____ Period____

Solve for x. Assume that lines which appear tangent are tangent.

1)



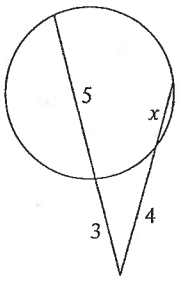
$15^2 = 9(x+9)$

$225 = 9x + 81$

$9x = 144$

$x = 16$

2)



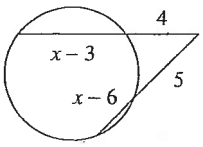
$4(x+4) = 3(8)$

$4x + 16 = 24$

$4x = 8$

$x = 2$

3)



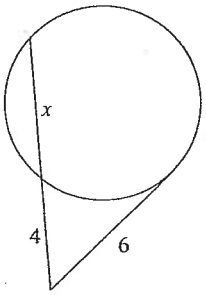
$4(x-3+4) = 5(x-6+5)$

$4(x+1) = 5(x-1)$

$4x + 4 = 5x - 5$

$x = 9$

4)



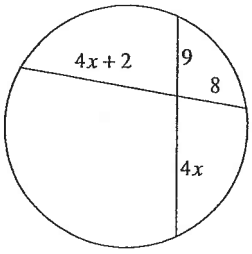
$4(x+4) = 6^2$

$4x + 16 = 36$

$4x = 20$

$x = 5$

5)



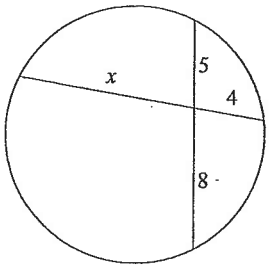
$8(4x+2) = 9(4x)$

$32x + 16 = 36x$

$16 = 4x$

$x = 4$

6)

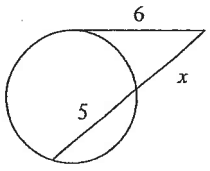


$4x = 5(8)$

$4x = 40$

$x = 10$

7)



$x(x+5) = 6^2$

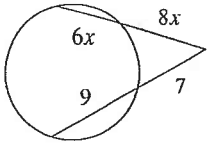
$x^2 + 5x = 36$

$x^2 + 5x - 36 = 0$

$(x+9)(x-4) = 0$

$x = -9, 4$

8)



$8x(14x) = 7(16)$

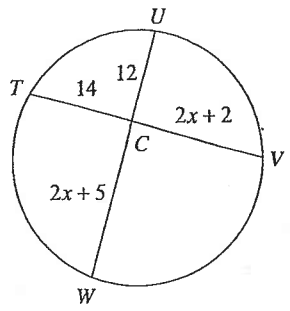
$112x^2 = 112$

$x^2 = 1$

$x = 1, -1$

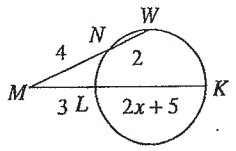
Find the measure of the line segment indicated. Assume that lines which appear tangent are tangent.

9) Find *UW*



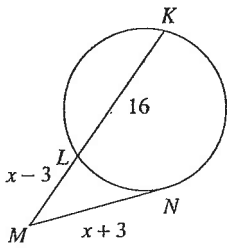
$12(2x+5) = 14(2x+2)$
$24x + 60 = 28x + 28$
$-4x = -32$
$x = 8$
$UW = 12 + 2x + 5$
$= 12 + 2(8) + 5$
$= 33$

10) Find *KM*



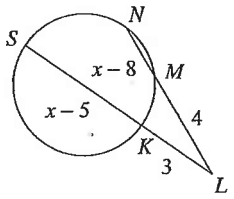
$3(2x+5+3) = 4(6)$
$3(2x+8) = 24$
$6x + 24 = 24$
$6x = 0$
$x = 0$
$KM = 3 + 2x + 5$
$= 3 + 2(0) + 5$
$= 8$

11) Find *NM*



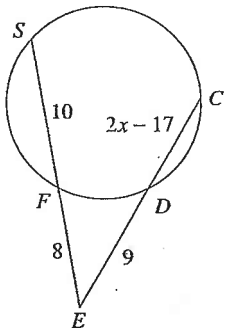
$(x+3)^2 = (x-3)(x+13)$
$x^2 + 6x + 9 = x^2 + 10x - 39$
$-4x = -48$
$x = 12$
$NM = x + 3$
$= 12 + 3$
$= 15$

12) Find *NL*



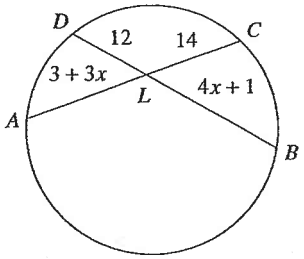
$3(x-5+3) = 4(x-8+4)$
$3(x-2) = 4(x-4)$
$3x - 6 = 4x - 16$
$-x = -10$
$x = 10$
$NL = 4 + x - 8$
$= 4 + 10 - 8$
$= 6$

13) Find *CE*



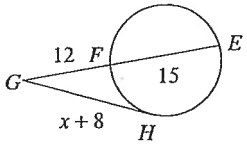
$9(2x - 17 + 9) = 8(18)$
$9(2x - 8) = 144$
$18x - 72 = 144$
$18x = 216$
$x = 12$
$CE = 2x - 17 + 9$
$= 2(12) - 17 + 9$
$= 16$

14) Find *CA*



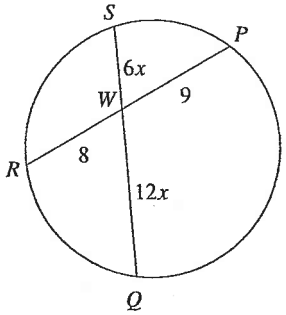
$14(3 + 3x) = 12(4x + 1)$
$42 + 42x = 48x + 12$
$-6x = -30$
$x = 5$
$CA = 3 + 3x + 14$
$= 3 + 3(5) + 14$
$= 32$

15) Find *HG*



$(x+8)^2 = 12(27)$
$x^2 + 16x + 64 = 324$
$x^2 + 16x - 260 = 0$
$(x + 26)(x - 10) = 0$
$x = -26, 10$
$HG = x + 8$
$= 10 + 8$
$= 18$

16) Find *WS*



$6x(12x) = 8(9)$
$72x^2 = 72$
$x^2 = 1$
$x = 1, -1$
$WS = 6x$
$= 6(1)$
$= 6$

* Assume "?" = x

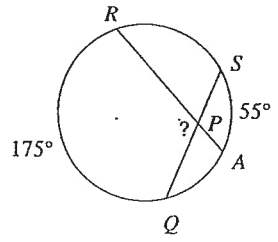
Name_____

Secant Angles Inside + Outside of Circle

Date_____ Period____

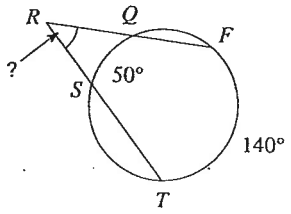
Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

1)



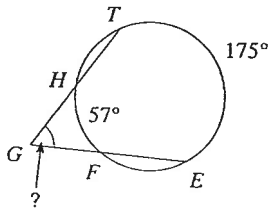
$x = \frac{1}{2}(55+175)$
$= \frac{1}{2}(230)$
$= 115$

2)



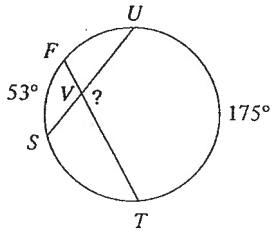
$x = \frac{1}{2}(140-50)$
$= \frac{1}{2}(90)$
$= 45$

3)



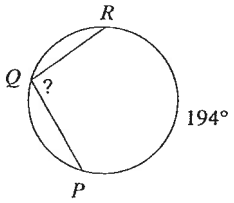
$x = \frac{1}{2}(175-57)$
$= \frac{1}{2}(118)$
$= 59$

4)



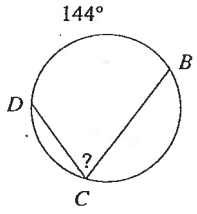
$x = \frac{1}{2}(175+53)$
$= \frac{1}{2}(228)$
$= 114$

5)



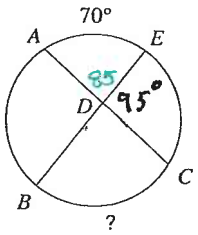
$x = \frac{1}{2}(194)$
$= 97$

6)



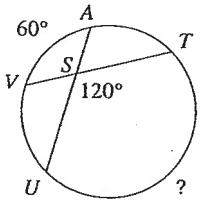
$x = \frac{1}{2}(144)$
$= 72$

7)



$85 = \frac{1}{2}(70+x)$
$170 = 70+x$
$x = 100$

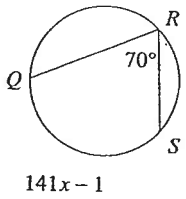
8)



$120 = \frac{1}{2}(60+x)$
$240 = 60+x$
$x = 180$

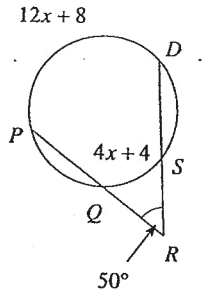
Solve for x. Assume that lines which appear tangent are tangent.

9)



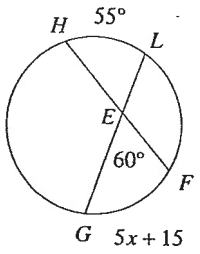
$70 = \frac{1}{2}(141x-1)$
$140 = 141x-1$
$141 = 141x$
$x = 1$

10)



$50 = \frac{1}{2}(12x+8-(4x+4))$
$100 = 12x+8-4x-4$
$100 = 8x+4$
$96 = 8x$
$x = 12$

11)



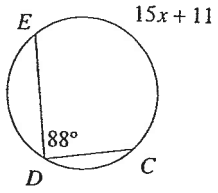
$60 = \frac{1}{2}(55 + 5x + 15)$

$120 = 70 + 5x$

$50 = 5x$

$x = 10$

12)



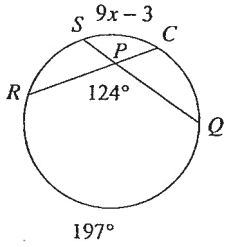
$88 = \frac{1}{2}(15x + 11)$

$176 = 15x + 11$

$165 = 15x$

$x = 11$

13)



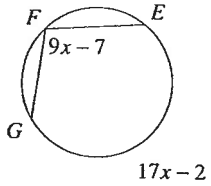
$124 = \frac{1}{2}(9x - 3 + 197)$

$248 = 9x + 194$

$54 = 9x$

$x = 6$

14)



$9x - 7 = \frac{1}{2}(17x - 2)$

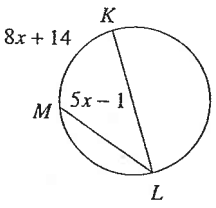
$18x - 14 = 17x - 2$

$x - 14 = -2$

$x = 12$

Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

15) Find $m\widehat{KLM}$



$5x - 1 = \frac{1}{2}(8x + 14)$

$10x - 2 = 8x + 14$

$2x - 2 = 14$

$2x = 16$

$x = 8$

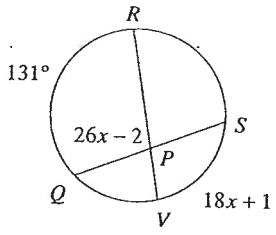
$m\widehat{KLM} = 360 - (8x + 14)$

$= 360 - (8(8) + 14)$

$= 360 - 78$

$= 282$

16) Find $m\angle QPR$



$26x - 2 = \frac{1}{2}(131 + 18x + 1)$

$52x - 4 = 132 + 18x$

$34x - 4 = 132$

$34x = 136$

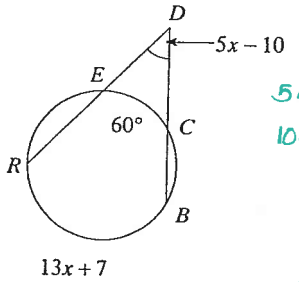
$x = 4$

$m\angle QPR = 26x - 2$

$= 26(4) - 2$

$= 102$

17) Find $m\widehat{RB}$



$5x - 10 = \frac{1}{2}(13x + 7 - 60)$

$10x - 20 = 13x - 53$

$-3x - 20 = -53$

$-3x = -33$

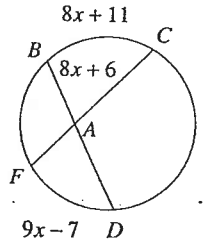
$x = 11$

$m\widehat{RB} = 13x + 7$

$= 13(11) + 7$

$= 150$

18) Find $m\widehat{BC}$



$8x + 6 = \frac{1}{2}(8x + 11 + 9x - 7)$

$16x + 12 = 17x + 4$

$-x + 12 = 4$

$-x = -8$

$x = 8$

$m\widehat{BC} = 8x + 11$

$= 8(8) + 11$

$= 75$

* Assume "?" = x

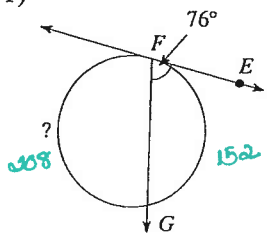
Name_____

Secant-Tangent and Tangent-Tangent Angles

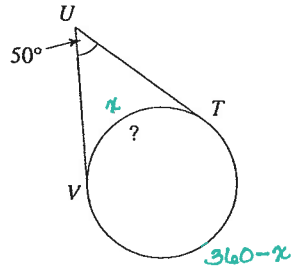
Date_____ Period____

Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

1)

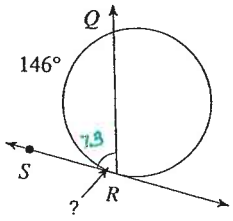


2)

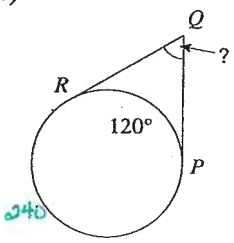


$50 = \frac{1}{2}(360 - x - x)$
$100 = 360 - 2x$
$-260 = -2x$
$x = 130$

3)

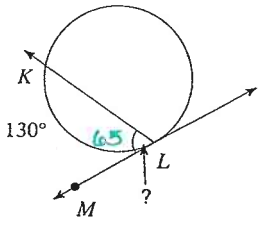


4)

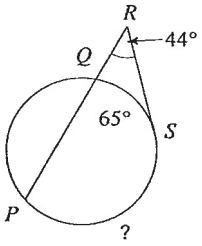


$x = \frac{1}{2}(240 - 120)$
$= \frac{1}{2}(120)$
$= 60$

5)

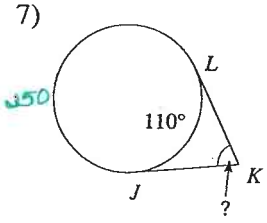


6)



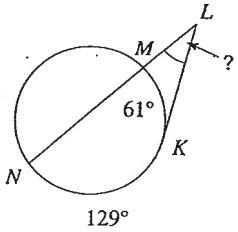
$44 = \frac{1}{2}(x - 65)$
$88 = x - 65$
$x = 153$

7)



$x = \frac{1}{2}(250 - 110)$
$= \frac{1}{2}(140)$
$= 70$

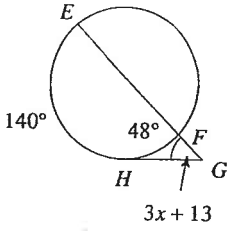
8)



$x = \frac{1}{2}(129 - 61)$
$= \frac{1}{2}(68)$
$= 34$

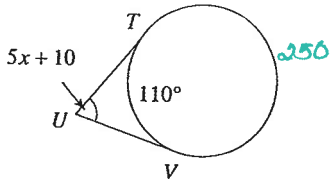
Solve for x. Assume that lines which appear tangent are tangent.

9)



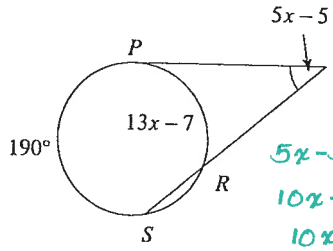
$3x + 13 = \frac{1}{2}(140 - 48)$
$6x + 26 = 92$
$6x = 66$
$x = 11$

10)



$5x + 10 = \frac{1}{2}(250 - 110)$
$10x + 20 = 140$
$10x = 120$
$x = 12$

11)



$5x-5=\frac{1}{2}(190-(13x-7))$

$10x-10=190-13x+7$

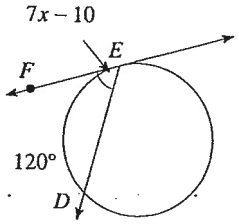
$10x-10=197-13x$

$23x-10=197$

$23x=207$

$x=9$

12)



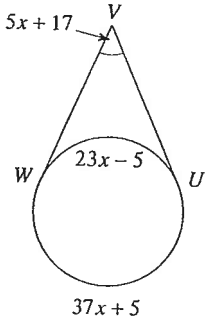
$7x-10=\frac{1}{2}(120)$

$7x-10=60$

$7x=70$

$x=10$

13)



$5x+17=\frac{1}{2}(37x+5-(23x-5))$

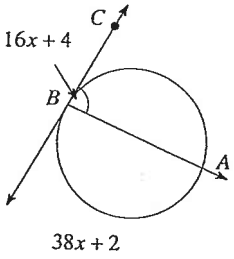
$10x+34=37x+5-23x+5$

$10x+34=14x+10$

$-4x=-24$

$x=6$

14)



$16x+4=\frac{1}{2}(360-(38x+2))$

$32x+8=360-38x-2$

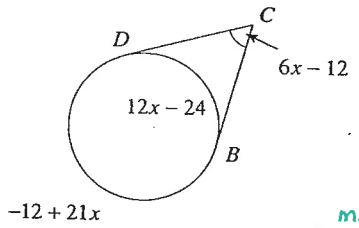
$32x+8=358-38x$

$70x=350$

$x=5$

Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

15) Find $m\widehat{BD}$



$6x-12=\frac{1}{2}(-12+21x-(12x-24))$

$12x-24=-12+21x-12x+24$

$12x-24=9x+12$

$3x-24=12$

$3x=36$

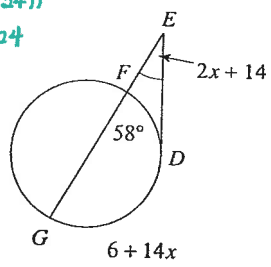
$x=12$

$m\widehat{BD}=12x-24$

$=12(12)-24$

$=120$

16) Find $m\angle DEG$



$2x+14=\frac{1}{2}(6+14x-58)$

$4x+28=14x-52$

$-10x+28=-52$

$-10x=-80$

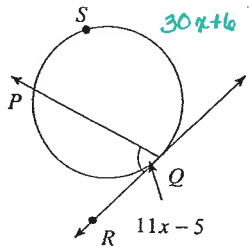
$x=8$

$m\angle DEG=2x+14$

$=2(8)+14$

$=30$

17) $m\widehat{PSQ}=30x+6$
Find $m\widehat{PSQ}$



$11x-5=\frac{1}{2}(360-(30x+6))$

$22x-10=360-30x-6$

$22x-10=-30x+354$

$52x-10=354$

$52x=364$

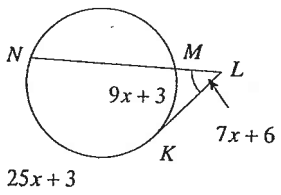
$x=7$

$m\widehat{PSQ}=30x+6$

$=30(7)+6$

$=216$

18) Find $m\widehat{NK}$



$7x+6=\frac{1}{2}(25x+3-(9x+3))$

$14x+12=25x+3-9x-3$

$14x+12=16x$

$12=2x$

$x=6$

$m\widehat{NK}=25x+3$

$=25(6)+3$

$=153$