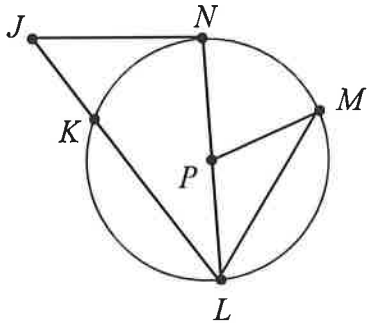
Unit 10 Test Study Guide (Circles)

Name: _____

Date: _____ Block: _____

Topic 1: Parts of Circles

1. Using the diagram below, give an example of each circle part.



a. Center: _____

b. Radius: _____

c. Diameter: _____

d. Chord: _____

e. Secant: _____

f. Tangent: _____

g. Central Angle: _____

h. Inscribed Angle: _____

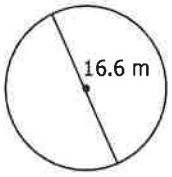
i. Minor Arc: _____

j. Major Arc: _____

k. Semicircle: _____

Topic 2: Area & Circumference

2. Find the area and circumference of the circle to the right.



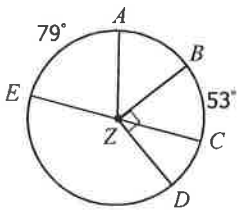
3. Find the radius of a circle with a circumference of 106.81 centimeters.

4. Find the diameter of a circle with an area of 95.03 square feet.

5. Find the circumference of a circle with an area of 254.47 square inches.

Topic 3: Central Angles

6. Find each arc measure.



a) $m\widehat{CD}$ = _____

b) $m\widehat{AB}$ = _____

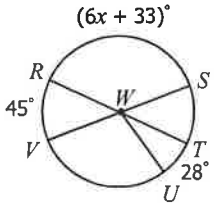
c) $m\widehat{ED}$ = _____

d) $m\widehat{EB}$ = _____

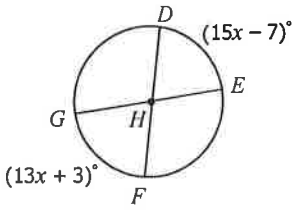
e) $m\widehat{BDE}$ = _____

f) $m\widehat{DEC}$ = _____

7. Solve for x.

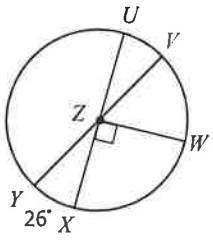


8. Find $\overset{\frown}{mEF}$.



Topic 4: Arc Lengths

If the circle below has a radius of 15 cm, find each arc length.

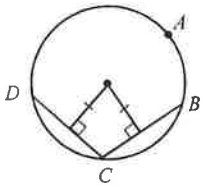


9. $\overset{\frown}{VW}$

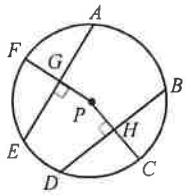
10. $\overset{\frown}{UXV}$

Topic 5: Chords & Arcs

11. If $\overset{\frown}{mDC} = (12x + 7)^\circ$ and $\overset{\frown}{mCB} = (18x - 23)^\circ$, find $\overset{\frown}{mDAB}$.



12. If $GP = PH$, $GA = 17$, $\overset{\frown}{mED} = 37^\circ$, and $\overset{\frown}{mAB} = 87^\circ$, find each measure.



$DB =$ _____

$EG =$ _____

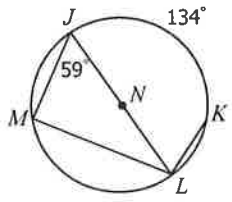
$\overset{\frown}{mDB} =$ _____

$\overset{\frown}{mFA} =$ _____

$\overset{\frown}{mDC} =$ _____

Topic 6: Inscribed Angles

13. Find each measure.



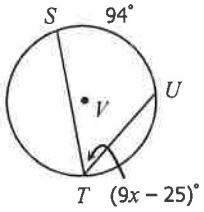
a) $\overset{\frown}{mML} =$ _____

b) $m\angle JLK =$ _____

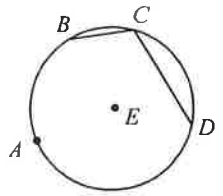
c) $m\angle JLM =$ _____

d) $\overset{\frown}{mMJ} =$ _____

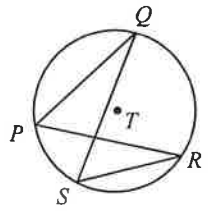
14. Solve for x.



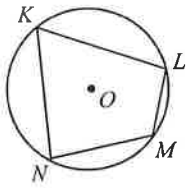
15. If $m\angle BCD = (7x + 10)^\circ$ and $m\overset{\frown}{BAD} = (19x - 50)^\circ$, find $m\overset{\frown}{BAD}$.



16. If $m\angle PQS = (6x + 1)^\circ$ and $m\angle PRS = (34 - 5x)^\circ$, find $m\overset{\frown}{PS}$.



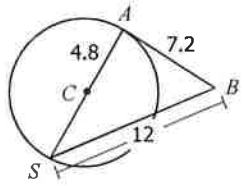
17. If $m\angle K = (8x - 19)^\circ$ and $m\angle M = (5x + 43)^\circ$, find $m\angle M$.



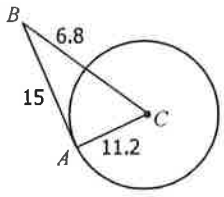
Topic 7: Tangents

For questions 18-19, determine if $\overline{AB}$ is tangent to circle C.

18.

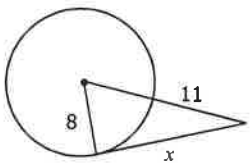


19.

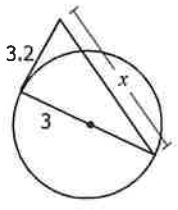


For questions 20-21, solve for x. Assume segments that appear to be tangent are tangent.

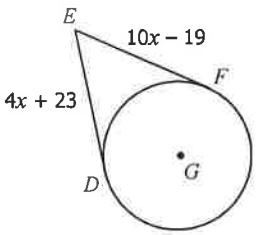
20.



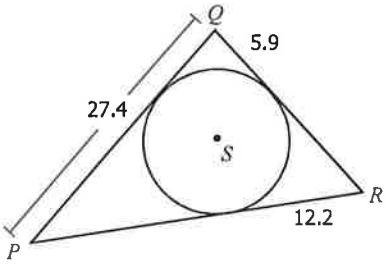
21.



22. If $\overline{DE}$ and $\overline{EF}$ are tangent to circle G, find EF.



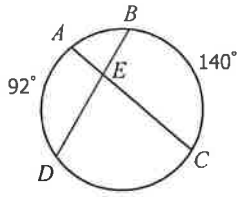
23. Find the perimeter of ΔPQR.



Topic 8: Angles formed by Intersecting Chords, Secants, & Tangents

For questions 24-31, find each measure. Assume segments that appear to be tangent are tangent.

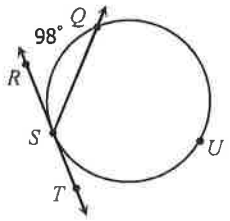
24.



$m\angle AED =$ _____

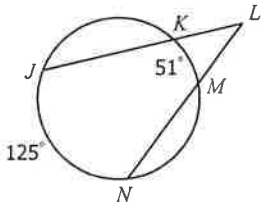
$m\angle DEC =$ _____

25.



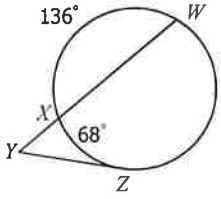
$m\angle QST =$ _____

26.



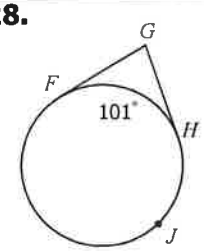
$m\angle KLM =$ _____

27.



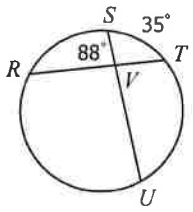
$m\angle XYZ =$ _____

28.



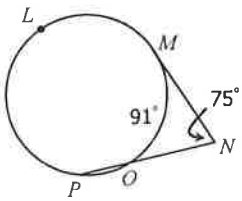
$m\angle FGH =$ _____

29.



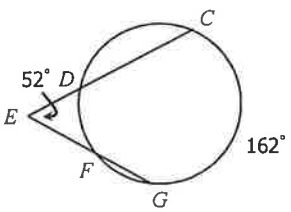
$m\widehat{RU} =$ _____

30.



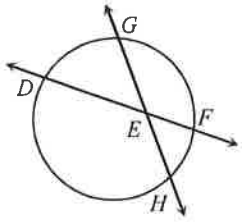
$m\widehat{MLP} =$ _____

31.

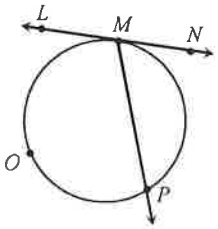


$m\widehat{DF} =$ _____

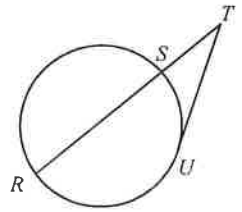
32. If $m\overset{\frown}{DH} = (11x + 7)^\circ$, $m\overset{\frown}{GF} = (5x + 9)^\circ$, and $m\angle GEF = (10x - 22)^\circ$, find $m\overset{\frown}{DH}$.



33. If $m\overset{\frown}{MOP} = (11x - 38)^\circ$ and $m\angle LMP = (3x + 41)^\circ$, find $m\angle NMP$.



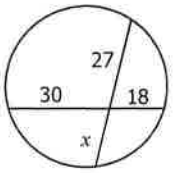
34. If $m\overset{\frown}{RU} = (16x - 13)^\circ$, $m\overset{\frown}{SU} = (11x - 24)^\circ$, and $m\angle STU = (3x + 1)^\circ$, find $m\overset{\frown}{SU}$.



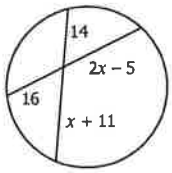
Topic 9: Segment Lengths formed by Intersecting Chords, Secants, & Tangents

For questions 35-38, solve for x. Assume segments that appear to be tangent are tangent.

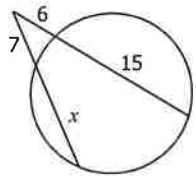
35.



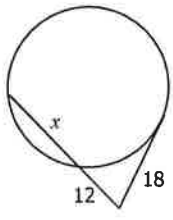
36.



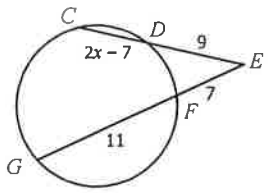
37.



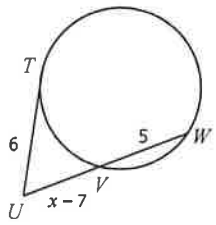
38.



39. Find CD.



40. Find UW.



Topic 10: Equations of Circles

Identify the center and radius/diameter for the following circles.

41. $(x + 2)^2 + (y - 7)^2 = 16$ **Center:** _____; **Radius:** _____

42. $x^2 + y^2 = 121$ **Center:** _____; **Diameter:** _____

Using the given information, write the equation of the circle.

43. Center: (-3, 4), Radius: 7

44. Center: (-9, 0), Diameter: 20

45. Center: (-7, -1), Diameter: 9

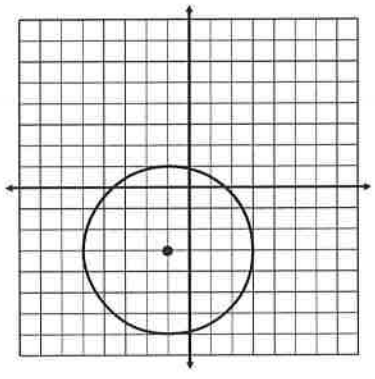
46. Center: (12, 5), Radius: $\sqrt{89}$

47. Center: (2, -2), Circumference: 12π

48. Center: (0, 10), Area: 225π

49. Center: (-4, 7), Point on Circle: (-1, 9)

50.



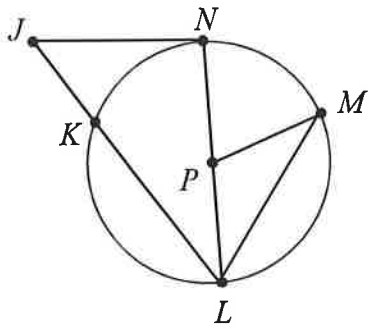
Test Study Guide (Circles)

Name: _____

Date: _____ Block: _____

Topic 1: Parts of Circles

1. Using the diagram below, give an example of each circle part.



a. Center: P

b. Radius: $\overline{PM}$

c. Diameter: $\overline{NL}$

d. Chord: $\overline{ML}$

e. Secant: $\overleftrightarrow{JL}$

f. Tangent: $\overleftrightarrow{JN}$

g. Central Angle: $\angle MPL$

h. Inscribed Angle: $\angle NLK$

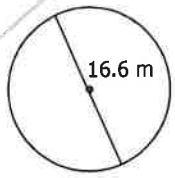
i. Minor Arc: $\overset{\frown}{NK}$

j. Major Arc: $\overset{\frown}{MLN}$

k. Semicircle: $\overset{\frown}{NKL}$

Topic 2: Area & Circumference

2. Find the area and circumference of the circle to the right.



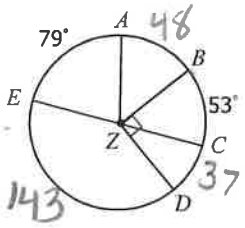
3. Find the radius of a circle with a circumference of 106.81 centimeters.

4. Find the diameter of a circle with an area of 95.03 square feet.

5. Find the circumference of a circle with an area of 254.47 square inches.

Topic 3: Central Angles

6. Find each arc measure.



a) $m\overset{\frown}{CD}$ = 37°

b) $m\overset{\frown}{AB}$ = 48°

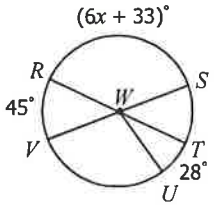
c) $m\overset{\frown}{ED}$ = 143°

d) $m\overset{\frown}{EB}$ = 127°

e) $m\overset{\frown}{BDE}$ = 233°

f) $m\overset{\frown}{DEC}$ = 323°

7. Solve for x.



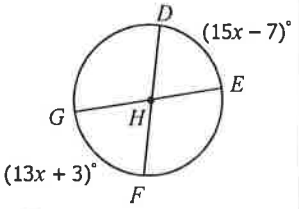
$6x+33+45=180$

$6x+78=180$

$6x=102$

$x=17$

8. Find $\overset{\frown}{mEF}$.



$13x+3=15x-7$

$10=2x$

$5=x$

$13(5)+3$

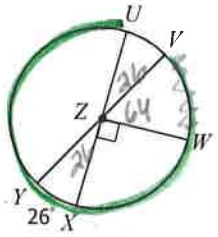
$65+3$

68

$\overset{\frown}{EF}=112$

Topic 4: Arc Lengths

If the circle below has a radius of 15 cm, find each arc length.



9. $\overset{\frown}{VW}$

$\frac{AL}{2\pi(15)}=\frac{64}{360}$

$1920\pi=360$

$\frac{16\pi}{3}=\overset{\frown}{VW}$

16.76 cm

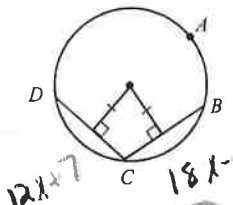
10. $\overset{\frown}{UXV}$

$\frac{AL}{2\pi(15)}=\frac{334}{360}$

≈ 87.44 cm

Topic 5: Chords & Arcs

11. If $\overset{\frown}{mDC}=(12x+7)^\circ$ and $\overset{\frown}{mCB}=(18x-23)^\circ$, find $\overset{\frown}{mDAB}$.



$12x+7=18x-23$

$30=6x$

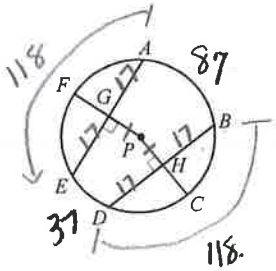
$5=x$

$\overset{\frown}{DC}$ $12(5)+7=67$

$m\overset{\frown}{DAB}=360-67$

226°

12. If $GP = PH$, $GA = 17$, $\overset{\frown}{mED}=37^\circ$, and $\overset{\frown}{mAB}=87^\circ$, find each measure.



$DB=$ 34

$EG=$ 17

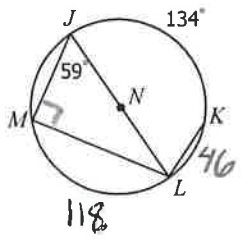
$\overset{\frown}{mDB}=$ 118

$\overset{\frown}{mFA}=$ 59°

$\overset{\frown}{mDC}=$ 59°

Topic 6: Inscribed Angles

13. Find each measure.



a) $\overset{\frown}{mML}=$ 118°

b) $m\angle JLK=$ 67°

c) $m\angle JLM=$ 31°

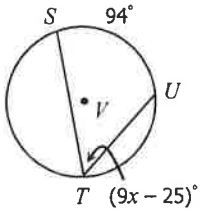
d) $\overset{\frown}{mMJ}=$ 62

14. Solve for x.

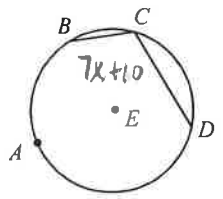
$9x-25=\frac{1}{2}(94)$

$18x-50=94$

$x=8$



15. If $m\angle BCD = (7x + 10)^\circ$ and $m\overset{\frown}{BAD} = (19x - 50)^\circ$, find $m\overset{\frown}{BAD}$.



$2(7x+10) = 19x - 50$

$14x + 20 = 19x - 50$

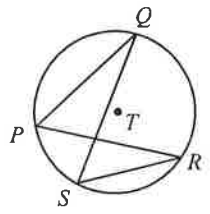
$70 = 5x$

$14 = x$

$19(14) - 50$

216°

16. If $m\angle PQS = (6x + 1)^\circ$ and $m\angle PRS = (34 - 5x)^\circ$, find $m\overset{\frown}{PS}$.



$6x + 1 = 34 - 5x$

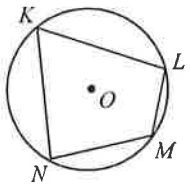
$x = 3$

$m\angle PQS = 6(3) + 1$

19

$19(2) = 380$

17. If $m\angle K = (8x - 19)^\circ$ and $m\angle M = (5x + 43)^\circ$, find $m\angle M$.



$8x - 19 + 5x + 43$

$13x + 24 = 180$

$13x = 156$

$x = 12$

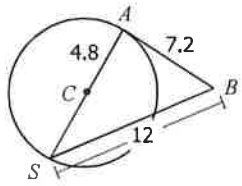
$5(12) + 43$

103°

Topic 7: Tangents

For questions 18-19, determine if $\overline{AB}$ is tangent to circle C.

18.

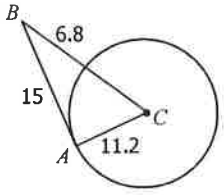


$7.2^2 + 9.6^2 = 12^2$

$144 = 144$

YES

19.



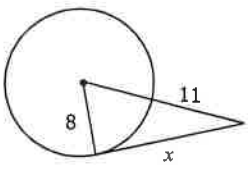
$15^2 + 11.2^2 = 18^2$

$350.44 \neq 324$

NO

For questions 20-21, solve for x. Assume segments that appear to be tangent are tangent.

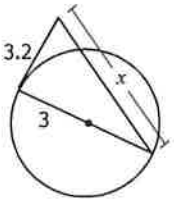
20.



$8^2 + x^2 = 11^2$

$x = 17.23$

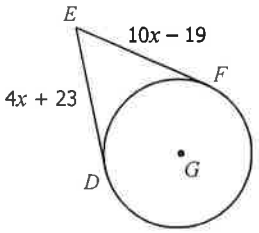
21.



$3.2^2 + 6^2 = x^2$

$x = 6.8$

22. If $\overline{DE}$ and $\overline{EF}$ are tangent to circle G, find EF.



$4x+23=10x-19$

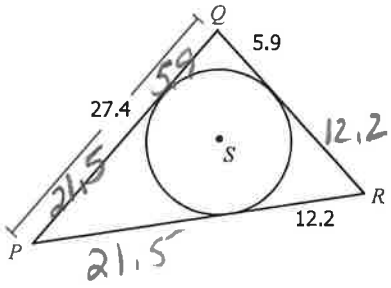
$42=6x$

$7=x$

$EF=10(7)-19$

$EF=51$

23. Find the perimeter of ΔPQR.

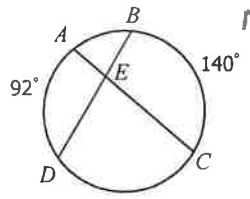


79.2

Topic 8: Angles formed by Intersecting Chords, Secants, & Tangents

For questions 24-31, find each measure. Assume segments that appear to be tangent are tangent.

24.



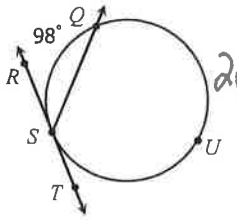
$m\angle AED=\frac{1}{2}(92+140)$

$=\frac{1}{2}(232)$

$m\angle AED =$ 116°

$m\angle DEC =$ 64°

25.

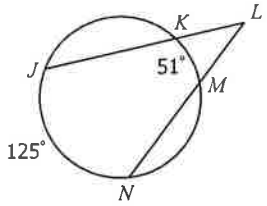


262.

$\frac{1}{2}(262)$

$m\angle QST =$ 131°

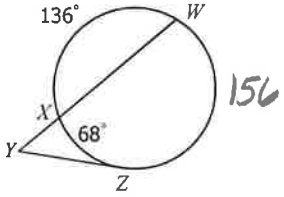
26.



$m\angle L=\frac{1}{2}(125-51)$

$m\angle KLM =$ 37°

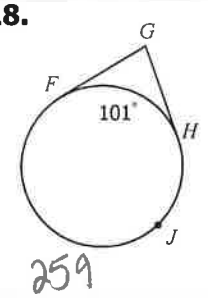
27.



$\angle 4=\frac{1}{2}(156-68)$

$m\angle XYZ =$ 44°

28.



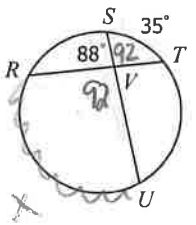
259

$m\angle G=\frac{1}{2}(259-101)$

$=\frac{1}{2}(158)$

$m\angle FGH =$ 79°

29.



X

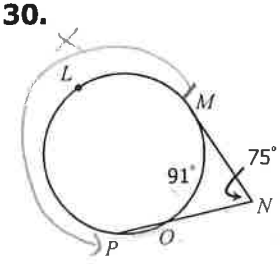
$92=\frac{1}{2}(35+x)$

$184=35+x$

$149=x$

$\overset{\frown}{mRU} =$ 149°

30.

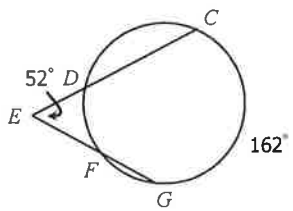


$75=\frac{1}{2}(x-91)$

$150=x-91$

$\overset{\frown}{mMLP} =$ 241°

31.

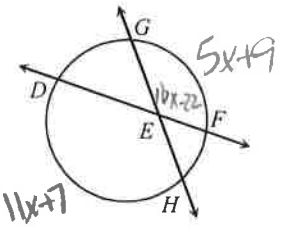


$52=\frac{1}{2}(162-x)$

$104=162-x$

$\overset{\frown}{mDF} =$ 58°

32. If $m\overset{\frown}{DH} = (11x + 7)^\circ$, $m\overset{\frown}{GF} = (5x + 9)^\circ$, and $m\angle GEF = (10x - 22)^\circ$, find $m\overset{\frown}{DH}$.



$16x - 22 = \frac{1}{2}[5x + 9 + 11x + 7]$

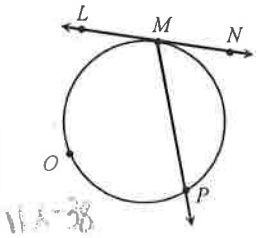
$20x - 44 = 16x + 16$

$4x = 60 \quad x = 15$

$\overset{\frown}{DH} = 11(15) + 7$

$= 172^\circ$

33. If $m\overset{\frown}{MOP} = (11x - 38)^\circ$ and $m\angle LMP = (3x + 41)^\circ$, find $m\angle NMP$.



$3x + 41 = \frac{1}{2}(11x - 38)$

$6x + 82 = 11x - 38$

$120 = 5x$

$24 = x$

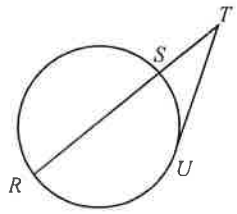
$m\angle LMP = 3(24) + 41$

$= 113$

$m\angle NMP = 180 - 113$

$= 67^\circ$

34. If $m\overset{\frown}{RU} = (16x - 13)^\circ$, $m\overset{\frown}{SU} = (11x - 24)^\circ$, and $m\angle STU = (3x + 1)^\circ$, find $m\overset{\frown}{SU}$.



$3x + 1 = \frac{1}{2}[(16x - 13) - (11x - 24)]$

$6x + 2 = 5x + 11$

$x = 9$

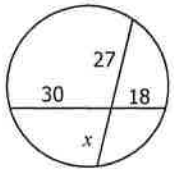
$m\overset{\frown}{SU} = 11(9) - 24$

$m\overset{\frown}{SU} = 75^\circ$

Topic 9: Segment Lengths formed by Intersecting Chords, Secants, & Tangents

For questions 35-38, solve for x. Assume segments that appear to be tangent are tangent.

35.

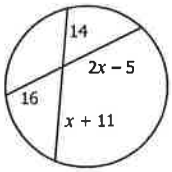


$27x = 30(18)$

$27x = 540$

$x = 20$

36.



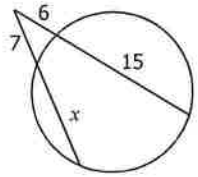
$16(2x - 5) = 14(x + 11)$

$32x - 80 = 14x + 154$

$18x = 234$

$x = 13$

37.



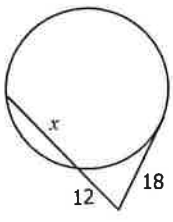
$7(x + 7) = 6(21)$

$7x + 49 = 126$

$7x = 77$

$x = 11$

38.



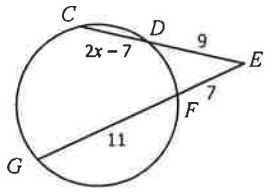
$18^2 = 12(x + 12)$

$324 = 12x + 144$

$180 = 12x$

$15 = x$

39. Find CD.



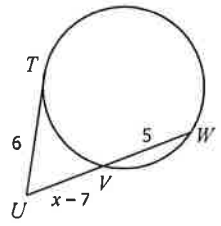
$9(2x+2) = 7(18)$

$18x + 18 = 126$

$18x = 108$

$x = 6$

40. Find UW.



$6^2 = (x-7)(x-2)$

$36 = x^2 - 9x + 14$

$0 = x^2 - 9x - 22$

$x - 11 \quad x + 2$

$x = 11$

~~$x = -2$~~

$UW = 11 - 7 + 5$

$UW = 9$

Topic 10: Equations of Circles

Identify the center and radius/diameter for the following circles.

41. $(x + 2)^2 + (y - 7)^2 = 16$ **Center:** $(-2, 7)$; **Radius:** 4

42. $x^2 + y^2 = 121$ **Center:** $(0, 0)$; **Diameter:** 22

Using the given information, write the equation of the circle.

43. Center: (-3, 4), Radius: 7

$(x+3)^2 + (y-4)^2 = 49$

44. Center: (-9, 0), Diameter: 20

$(x+9)^2 + y^2 = 100$

45. Center: (-7, -1), Diameter: 9

$(x+7)^2 + (y+1)^2 = 20.25$

46. Center: (12, 5), Radius: $\sqrt{89}$

$(x-12)^2 + (y-5)^2 = 89$

47. Center: (2, -2), Circumference: 12π

$12\pi = 2\pi r$

$6 = r$

$(x-2)^2 + (y+2)^2 = 36$

48. Center: (0, 10), Area: 225π

$\pi r^2 = 225\pi$

$r = 15$

$x^2 + (y-10)^2 = 225$

49. Center: (-4, 7), Point on Circle: (-1, 9)

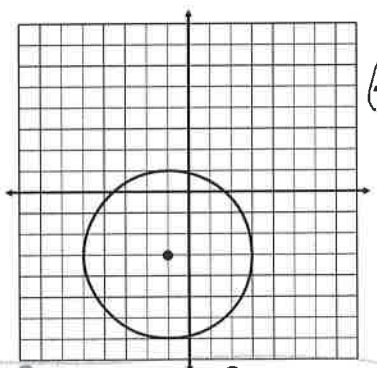
$d = \sqrt{(-4+1)^2 + (7-9)^2}$

$d = \sqrt{9 + 4}$

$d = \sqrt{13}$

$(x+4)^2 + (y-7)^2 = 13$

50.



$(x+1)^2 + (y+3)^2 = 16$