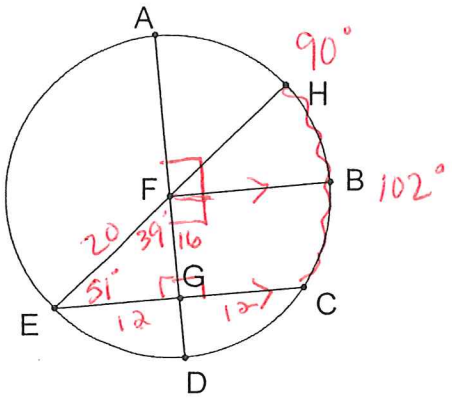
Geometry 21 — **Practice 12.1-~~12.4~~ 12.3 plus 10.6/10.7** — Name ANSWERS

Read directions carefully. Round all decimals to the nearest hundredth. SHOW ALL WORK.

In circle F; $m\overset{\frown}{AB} = 90°$, **EC = 24 cm, FG = 16 cm,** $\overline{FB} \parallel \overline{EC}$, $m\overset{\frown}{HC} = 102°$

$\overline{EG} \cong \overline{CG}$



Find;

1) GD = 4

2) $m\overset{\frown}{ED}$ = 39°

3) $m\overset{\frown}{AE}$ = 141°

4) $m\overset{\frown}{DC}$ = 39° → same as ED

5) FB = 20

6) m< HEC = 51°

7) m< HFB = 51°

8) Length (L) of $\overset{\frown}{AH}$ = 13.61 cm

$\frac{39}{360} = \frac{L}{2\pi(20)}$

$120L = 520\pi$

$L = 4.3\pi$

Using the diagram from above, fill in the blanks below;

9) $\overline{AD}$ is called a(n) diameter which is a special type of chord

10) $\overline{FB}$ is a(n) radius

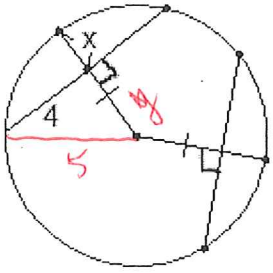
11) < FEC is called a(n) inscribed angle.

12) < HFD is called a(n) central angle, and $\overset{\frown}{DH}$ is its intercepted arc.

For #13 – 18, use each diagram to solve for "x";

13) x = 2

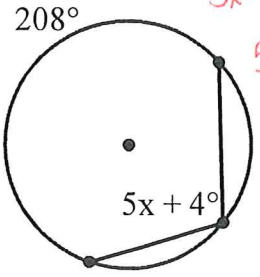
Radius = 5 cm



$y^2 + 4^2 = 5^2$

$y = 3$

14) x = 20

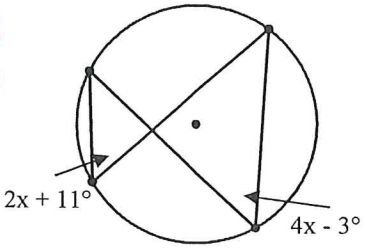


$5x + 4 = \frac{1}{2}(208)$

$5x + 4 = 104$

$5x = 100$

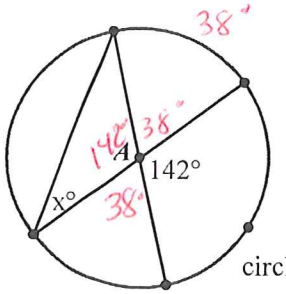
15) x = 7



$2x + 11 = 4x - 3$

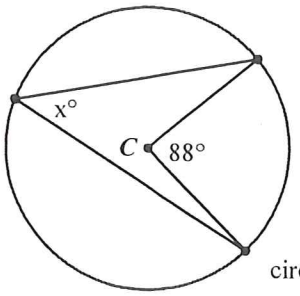
$14 = 2x$

16) x = 19°



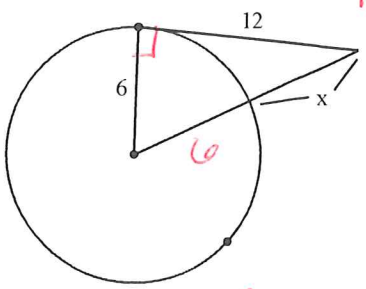
circle A

17) x = 44°



circle C

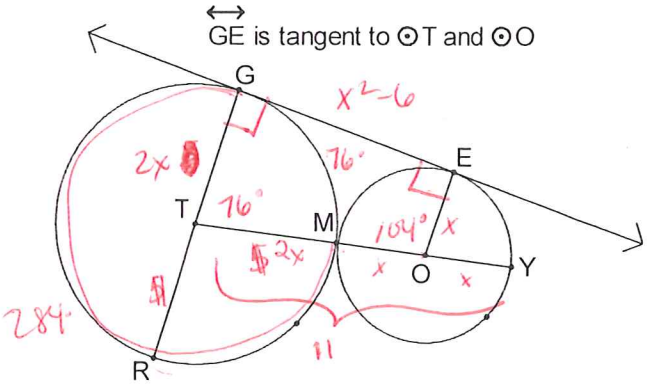
18) x = $6\sqrt{5}-6$ or 7.42



$6^2+12^2=y^2$
$36+144$
$180=y^2$
$y=\sqrt{180}$
$6\sqrt{5}$

$x+6=6\sqrt{5}$
$x=6\sqrt{5}-6$

Use the following diagram for # 19 – 21;



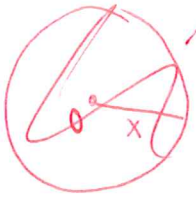
19) If $m\widehat{GRM}$ = 284°, then m < EOM = 104°

20) If GR = 10 cm and TY = 11 cm, then EO = 3

$5+2x=11$
$2x=6$
$x=3$

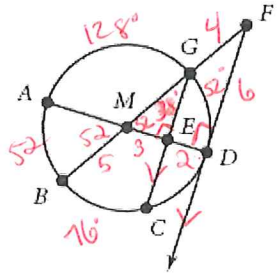
21) Use the following given facts to solve for x;
radius of circleO = x, GE = x^2-6, the radius of circle T = the diameter of circleO, perimeter of GEOT = 34

x = 3



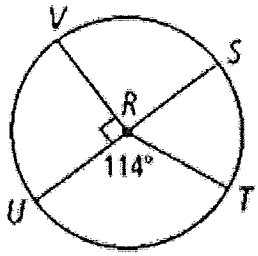
$2x+2x+x+x+x^2-6=21$
$-21\quad -21$
$x^2+6x-27=0$
$(x-3)(x+9)=0$
$x=3$ or -9

Ray *FD* is tangent to ⊙*M* at point *D*, $\overline{GC} \parallel \overrightarrow{FD}$, $m\widehat{BC}$ = 76°, *GF* = 4, *FD* = 6, *ED* = 2, $m\widehat{GD}$ = 52°, and *BM* = 5. Find the following: (MD is perpendicular to CG)



1. m∠*BFD* 38°
2. m∠*DEC* 90°
3. $m\widehat{AG}$ 128°
4. $m\widehat{AB}$ 52°
5. *GM* 5
6. *GC* 8

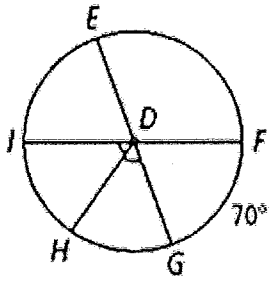
10.6 – 10.7 review/practice



Find the measure of each arc in circle R.

5. $\overset{\frown}{ST}$
6. $\overset{\frown}{SV}$
7. $\overset{\frown}{VST}$
8. $\overset{\frown}{UV}$
9. $\overset{\frown}{VUT}$
10. $\overset{\frown}{SVT}$
11. $\overset{\frown}{USV}$
12. $\overset{\frown}{UTS}$
13. $\overset{\frown}{UVT}$
14. $\overset{\frown}{TUS}$
15. $\overset{\frown}{TSU}$
16. $\overset{\frown}{VUS}$

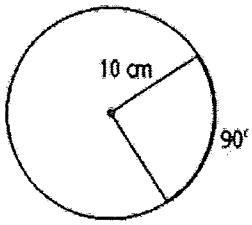
Find each indicated measure for $\odot D$.



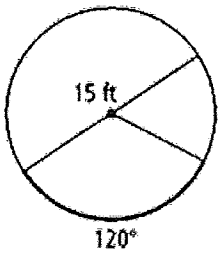
17. $m\angle EDI$
18. $m\overset{\frown}{EF}$
19. $m\overset{\frown}{GI}$
20. $m\angle IDH$
21. $m\overset{\frown}{FHE}$
22. $m\overset{\frown}{GIF}$

Find the length of each darkened arc. Leave answers in terms of pi.

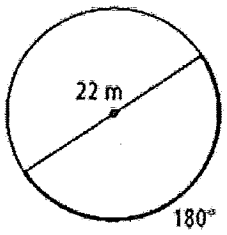
30.



31.

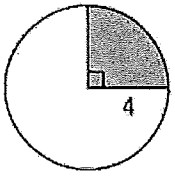


32.

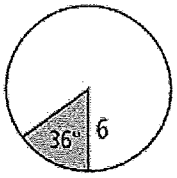


Find the area of each shaded sector of a circle. Leave your answer in terms of π.

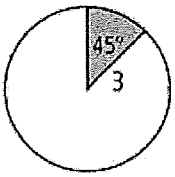
9.



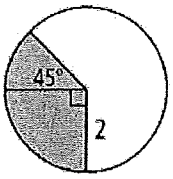
10.



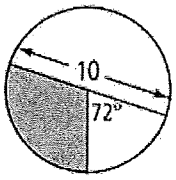
11.



12.



13.



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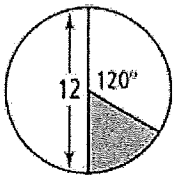

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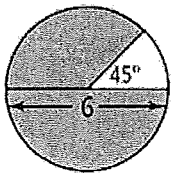
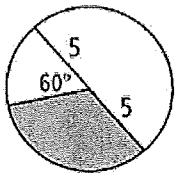


16.



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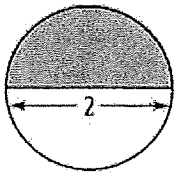
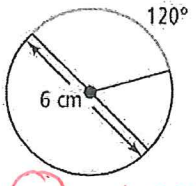


Name ANSWERS Period _____ Date _____

Geometry 21 - Extra Practice for Unit 8 Circles Test (10.6, 10.7, 12.1-12.5)

Lesson 10-6

(a) Find the circumference of each circle. (b) Find the length of the arc shown in gray. Leave your answers in terms of π

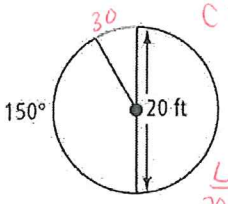
30. 

$C = 6\pi$

$\frac{L}{6\pi} = \frac{120}{360}$

$3L = 6\pi$

$L = 2\pi \approx 6.28$

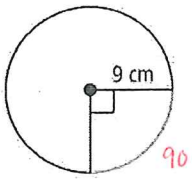
31. 

$C = 20\pi$

$\frac{L}{20\pi} = \frac{30}{360}$

$12L = 20\pi$

$L = \frac{5\pi}{3} \approx 5.24$

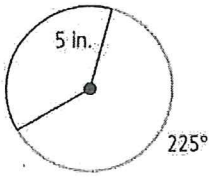
32. 

$C = 18\pi$

$\frac{L}{18\pi} = \frac{90}{360}$

$4L = 18\pi$

$L = \frac{9\pi}{2} \approx 14.14$

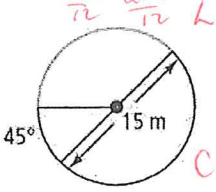
33. 

$C = 10\pi$

$\frac{L}{10\pi} = \frac{225}{360}$

$360L = 2250\pi$

$L = 6.25\pi \approx 19.63$

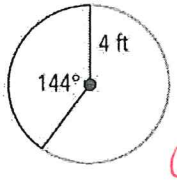
34. 

$C = 15\pi$

$\frac{L}{15\pi} = \frac{135}{180}$

$180L = 2025\pi$

$L = 5.625\pi \approx 17.67$

35. 

$C = 8\pi$

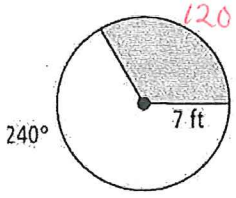
$\frac{L}{8\pi} = \frac{216}{360}$

$360L = 1728\pi$

$L = 4.8\pi$

Lesson 10-7

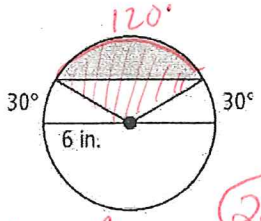
Find the area of each shaded sector or segment. Leave your answers in terms of π

37. 

$\frac{A}{\pi(49)} = \frac{120}{360}$

$3A = 49\pi$

$A = 16.\overline{3}\pi \approx 51.3$

38. 

$A_{sector} - A_{\Delta}$

$\frac{A}{36\pi} = \frac{120}{360}$

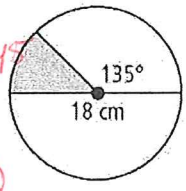
$3A = 36\pi$

$A = 12\pi$

$\frac{(6)(6)\sin 120°}{2}$

$\approx 22.1\ in^2$

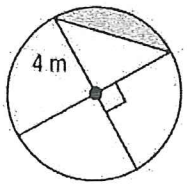
≈ 15.59

39. 

$\frac{A}{81\pi} = \frac{45}{360}$

$8A = 81\pi$

$A = 10.125\pi \approx 31.8$

40. 

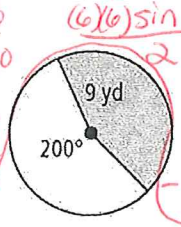
$A_{sector} - A_{\Delta}$

$\frac{A}{16\pi} = \frac{90}{360} - \frac{(4)(4)\sin 90}{2}$

$4A = 16\pi - 8$

$A = 4\pi - 8$

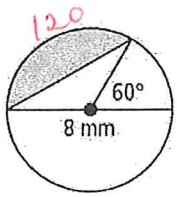
$12.57 - 8 = 4.57\ m^2$



$\frac{A}{81\pi} = \frac{160}{360}$

$1296\pi = 36A$

$A = 36\pi \approx 113.1\ yd^2$



$\frac{A}{16\pi} = \frac{120}{360} - \frac{A_{\Delta}}{\frac{(4)(4)\sin 120}{2}}$

$3A = 16\pi - 6.93$

$5.\overline{3}\pi = A_{sector}$

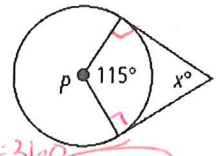
$\approx$

$16.76 - 6.93 =$

$9.825\ mm^2$

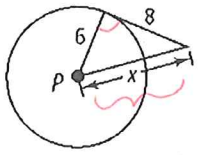
Lesson 12-1

Assume that the lines that appear to be tangent are tangent. *P* is the center of each circle. Find the value of *x*.

1. 

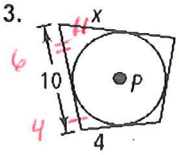
155+180+x=360

x=65

2. 

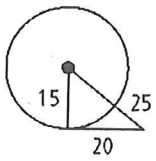
$6^2+8^2=x^2$

x=10

3. 

x=6

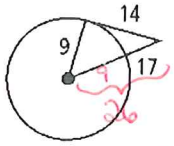
Determine whether a tangent line is shown in each diagram. Explain.

4. 

$15^2+20^2 \overset{?}{=} 25^2$

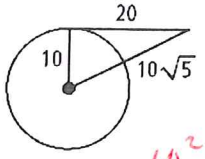
equal so right Δ

so yes tangent

5. 

$9^2+14^2 \neq 26^2$

No, not a right Δ

6. 

$10^2+20^2 = (10\sqrt{5})^2$

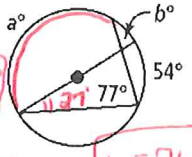
100+400 = 500

yes a rt Δ

so tangent

Lesson 12-3

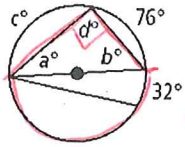
Find the value of each variable.

13. 

$a=\frac{77}{2}=38.5$

$27+77+b=180$

b=76°

14. 

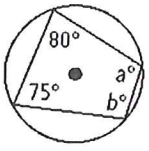
180°

$a=\frac{76}{2}=38°$

$b=\frac{104}{2}=52°$

$c=180-76=104°$

$d=\frac{180}{2}=180-38-52=90°$

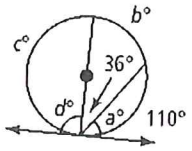
15. 

a=180-75=105°

b=180-80=100°

(opp. ∠'s supplem)

Find the value of each variable. Assume that rays that appear to be tangent are tangent.

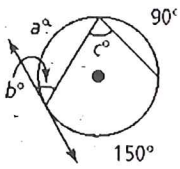
16. 

$a=\frac{110}{2}=55°$

$b=(36)(2)=72°$

c=180°

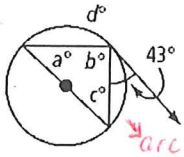
d=90° (180/2)

17. 

a=360-150-90=120°

$b=\frac{120}{2}=60°$

$c=\frac{150}{2}=75°$

18. 

a=43°

b=90° 180/2

c=94/2=47°

d=180-86=94°

Lesson 12-5

Write the standard equation of the circle with center *P*.

31. $P = (0, 0); r = 4$

$x^2 + y^2 = 16$

32. $P = (0, 5); r = 3$

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

33. $P = (9, -3); r = 7$

$(x-9)^2 + (y+3)^2 = 49$

34. $P = (-4, 0)$; through $(2, 1)$ (x, y)

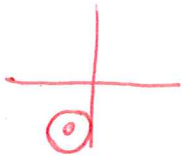
$(x+4)^2 + y^2 = 37$

$(2+4)^2 + 1^2 = r^2$
$6^2 + 1^2 = r^2$
$36 + 1 = r^2$
$37 = r^2$

Find the center and radius of each circle. Then graph the circle.

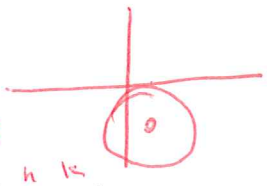
35. $(x + 1)^2 + (y + 3)^2 = 1$

Center = $(-1, -3)$
rad = 1



36. $(x - 1)^2 + (y + 2)^2 = 5$

Center $(1, -2)$
rad = $\sqrt{5} \approx 2.23$



37. When a coordinate grid is imposed over a map, the location of a radio station is given by (113, 215). A town located at (149, 138) is at the outermost edge of the circular region where clear reception is assured.

a. Write an equation that describes the boundary of the clear reception region. (h, k)

$(x-113)^2 + (y-215)^2 = 7225$

$(149-113)^2 + (138-215)^2 = r^2$
$(36)^2$
$1296 + 5929$
7225
$r = \sqrt{7225}$
$r = 85$

b. If the radio station boosts power to increase the size of the clear-reception region by a factor of 4, what will be the equation for the new boundary for clear reception?

$(x-113)^2 + (y-215)^2 = (340)^2$

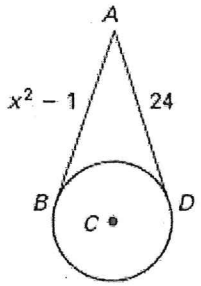
$(x-113)^2 + (y-215)^2 = 115{,}600$

(4 times the radius = $4(85)$ = 340)

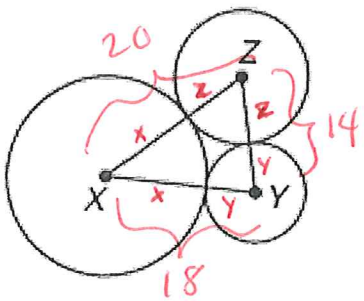
Mixed Review

2. $\overleftrightarrow{AB}$ and $\overleftrightarrow{AD}$ are tangent to $\odot C$. Find the value(s) of x.

$x^2 - 1 = 24$
$+1 \quad +1$
$x^2 = 25$
$x = 5, -5$



3. If $XY = 18$, $YZ = 14$, $XZ = 20$, find the radius of each circle.



$x + z = 20$
$-\ y + z = 14$
$x - y = 6$
$+\ x + y = 18$
$2x = 24$

(system of linear eqns. solved by Elimination Method)

$x = 12$ $\quad y = 6$ $\quad z = 8$

Find the measure of the arc or angle in $\odot O$, given $m\overset{\frown}{CD} = 108°$ and $m\overset{\frown}{BE} = 100°$.

9. $m\angle ABC$ 90°

10. $m\angle CED$ 54°

11. $m\angle BDE$ 50°

12. $m\angle BCE$ 50°

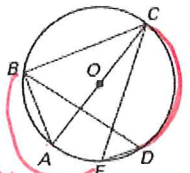
13. $m\angle ABD$ X

14. $m\angle CBD$ 54°

15. mAD X

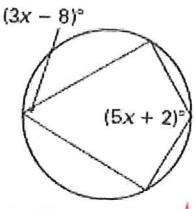
16. $mABC$ X

skip these sorry



skip #20&21 below:

Assume that lines that appear to be tangent are tangent. Find the value of each variable.

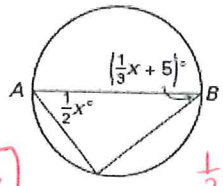
18. 

$3x - 8 + 5x + 2 = 180$

$8x - 6 = 180$

$8x = 186$

$x = 23.25$

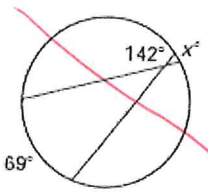
19. diameter $\overline{AB}$ 

$x = 102°$

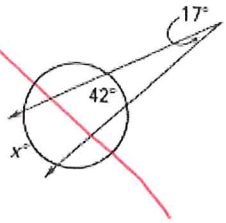
$\frac{1}{2}x + \frac{1}{3}x + 5 = 90$

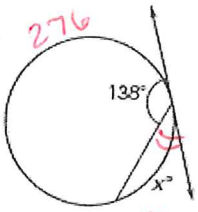
$\frac{3}{6}x + \frac{2}{6}x = 85$

$\frac{5}{6}x = 85$

20. 

skip #20&21

21. 

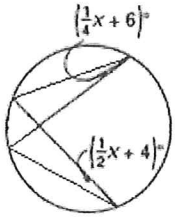
22. 276 

$180 - 138 = m\angle = 42°$

$m\,Arc = (42)(2) =$

84

84°

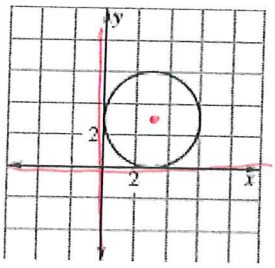
23. 

$\frac{1}{4}x + 6 = \frac{1}{2}x + 4$

$2 = \frac{1}{4}x$

$x = 8$

42. Give the coordinates of the center, the radius, and the equation of the circle.

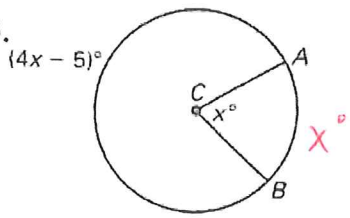


center (3, 3)

radius = 3

$(x-3)^2 + (y-3)^2 = 9$

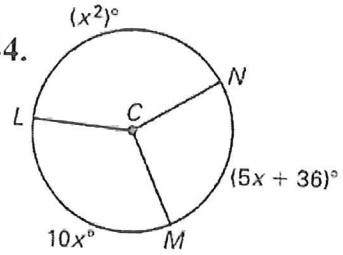
Find all possible values of x. Then determine the solution(s) of the problem.

43. 

$x + 4x - 5 = 360$

$5x = 365$

$x = 73$

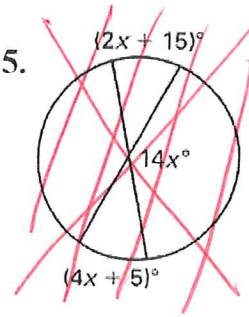
44. 

$x^2 + 10x + 5x + 36 = 360$

$x^2 + 15x - 324 = 0$

$(x + 27)(x - 12) = 0$

$x = -27, 12$

45. 

sorry again!

skip

ANSWERS

Completing the Square Practice

Directions: Solve each equation by completing the square. Express the answer in simplest radical form.

1. $x^2 + 6x + 4 = 0$

$x^2+6x+9 = -4+9$

$\sqrt{(x+3)^2} = \sqrt{5}$

$x+3 = \sqrt{5}$

$-3 \quad -3$

$x = \pm\sqrt{5} - 3$

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

$x^2+2x+1 = 5+1$

$\sqrt{(x+1)^2} = \sqrt{6}$

$x+1 = \sqrt{6}$

$x = \pm\sqrt{6} - 1$

3. $x^2 - 8x + 4 = 0$

$x^2-8x+16 = -4+16$

$\sqrt{(x-4)^2} = \sqrt{12}$

$x-4 = 2\sqrt{3}$

$x = \pm 2\sqrt{3} + 4$

4. $3x^2 - 6x - 1 = 0$

$3x^2 \quad -6x$

5. $4x^2 - 20x + 9 = 0$

6. $2x^2 + 4x + 1 = 0$

7. A circle has the equation $x^2 + y^2 - 2x + 6y + 3 = 0$. Express this equation in center-radius form.

$x^2-2x+1 + y^2+6y+9 = -3+1+9$

$(x-1)^2 + (y+3)^2 = 7$

8. A circle has the equation $x^2 + y^2 + 6x - 2y - 15 = 0$. Express this equation in center-radius form.

$x^2+6x+9 + y^2-2y+1 = 15+9+1$

$(x+3)^2 + (y-1)^2 = 25$

Match each equation in the first column with a corresponding true fact in the second column.

M 9. $(x-4)^2 + (y+6)^2 = 36$

T 10. $x^2 + y^2 + 2x - 4y - 11 = 0$ $11+1+4$

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

N 11. $(x+4)^2 + (y-6)^2 = 36$

S 12. $x^2 + y^2 - 4x + 10y + 20 = 0$ $-20+4+25$

B 13. $(x-2)^2 + (y+5)^2 = 9$

$x^2 + y^2 - 4x - 6y + 8 = 0$ $-8+4+9$

W 14. $(x-2)^2 + (y-3)^2 = 5$

H 15. $x^2 + y^2 - 8x + 2y + 8 = 0$ $-8+16+1$

$(x-4)^2 + (y+1)^2 = 9$

F 16. $x^2 + y^2 = 49$

Y 20. $(x-2)^2 + (y-3)^2 = 4$

$(0,3)$

$(0-2)^2 + (3-3)^2 = 4$

$(-2)^2 = 4$ ✓

Y. tangent to the y-axis at (0,3)

S. $(x-2)^2 + (y+5)^2 = 9$

B. Center (2,3), radius $\sqrt{5}$

F. Center at the origin

U. tangent to the x-axis at (4,0)

T. Center (-1,2), radius 4

N. Center (-4,6), radius 6

W. Center (4,-1), radius 3