

## Final Review #5

### Circles

Identify the radius and center of the circle given the equation.

1)  $(x - 2)^2 + (y + 4)^2 = 25$

$C = (2, -4)$   $r = 5$

2)  $(x + 3)^2 + (y - 1)^2 = 4$

$C = (-3, 1)$

$r = 2$

3)  $(x + 1)^2 + (y + 8)^2 = 16$

$C = (-1, -8)$   $r = 4$

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

$C = (5, 2)$

$r = 3$

5) Write the equation of the circle when the radius is 2 and the center is  $(-1, 3)$ .

$$(x + 1)^2 + (y - 3)^2 = 4$$

6) Write the equation of the circle when the radius is 3 and the center is  $(2, -5)$ .

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

7) Write the equation of the circle when the radius is 7 and the center is  $(-2, -1)$ .

$$(x + 2)^2 + (y + 1)^2 = 49$$

8) Write an equation of a circle whose center is  $(2, 5)$  and has the point  $(-7, -1)$  on the circle.

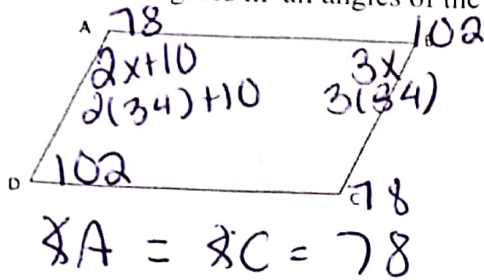
$$(x - 2)^2 + (y - 5)^2 = 117$$

9) Write an equation of a circle whose center is  $(14, 17)$  and has the point  $(15, 17)$  on the circle.

$$(x - 14)^2 + (y - 17)^2 = 1$$

## Quadrilaterals

- 10) In the accompanying diagram of parallelogram  $ABCD$ , if  $m\angle A = (2x + 10)$  and  $m\angle B = 3x$ . Find the number of degrees in all angles of the parallelogram.



$$\begin{aligned} 2x + 10 + 3x &= 180 \\ 5x + 10 &= 180 \\ 5x &= 170 \\ x &= 34 \end{aligned}$$

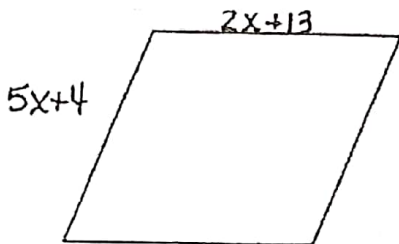
$\angle B = \angle D = 78$

- 11) In rectangle  $ABCD$ , diagonal  $AC = 3x + 15$  and diagonal  $BD = 4x - 5$ . Find the length of  $AC$ .

$$AC = 3(5) + 15 = 30$$

$$\begin{aligned} 3x + 15 &= 4x - 5 \\ -3x & \quad -3x \\ 15 &= 4x - 5 \\ 20 &= 4x \\ x &= 5 \end{aligned}$$

- 12) The image below is a rhombus. Solve for value of  $x$ .

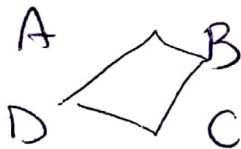


$$\begin{aligned} 5x + 4 &= 2x + 13 \\ 3x &= 9 \\ x &= 3 \end{aligned}$$

- 13) In square  $ABCD$ , angle  $c$  is  $5x + 15$ . Solve for  $x$ .

$$\begin{aligned} 5x + 15 &= 90 \\ 5x &= 75 \\ x &= 15 \end{aligned}$$

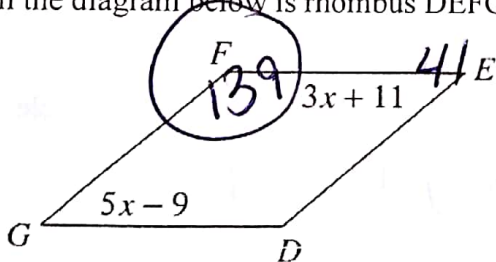
- 14) In parallelogram  $ABCD$ ,  $m\angle A = 4x - 20$  and  $m\angle C = 9x - 50$ . Find the value of  $\angle A$ .



$$4(6) - 20 = 4$$

$$\begin{aligned} 4x - 20 &= 9x - 50 \\ -20 &= 5x - 50 \\ 30 &= 5x \\ x &= 6 \end{aligned}$$

- 15) In the diagram below is rhombus  $DEFG$ . Using the diagram solve for angle  $F$ .



$$\begin{aligned} 3x + 11 &= 5x - 9 \\ 11 &= 2x - 9 \\ 20 &= 2x \\ x &= 10 \end{aligned}$$

## Mixed Review

16) Solve for  $x$  by completing the square:

a)  $x^2 - 8x + 2 = 0$

$$x^2 - 8x = -2$$

$$(x-4)^2 = -2 + 16$$

$$\sqrt{(x-4)^2} = \sqrt{14}$$

$$x-4 = \pm\sqrt{14}$$

$$x = 4 \pm \sqrt{14}$$

b)  $x^2 + 4x + 1 = 0$

$$x^2 + 4x = -1$$

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

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

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

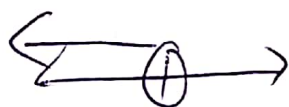
$$x = -2 \pm \sqrt{3}$$

17) Solve each inequality for all values of  $x$ . Express solution on a number line and use interval notation.

a)  $2x - 3 < x + 14$

$$x - 3 < 14$$

$$x < 17$$



17

$$(-\infty, 17)$$

b)  $-5(x - 2) \geq x + 28$

$$-5x + 10 \geq x + 28$$

$$10 \geq 6x + 28$$

$$-18 \geq 6x$$

$$-3 \geq x$$

$$x \leq -3$$



-3

18) Simplify:

a)

$$\frac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4}$$

$$\frac{2x^2}{3y^bz^7}$$

b)  $\sqrt{500}$

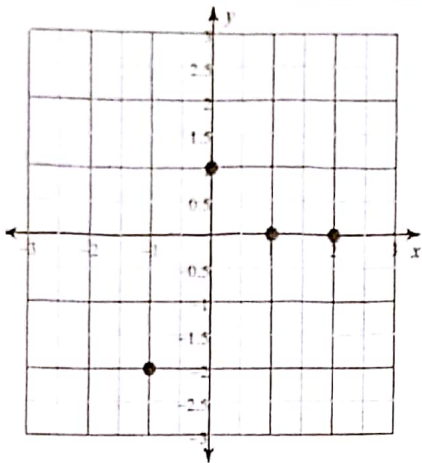
$$10\sqrt{5}$$

c)  $-8x^{-7} \cdot 3x^8$

$$-24x$$

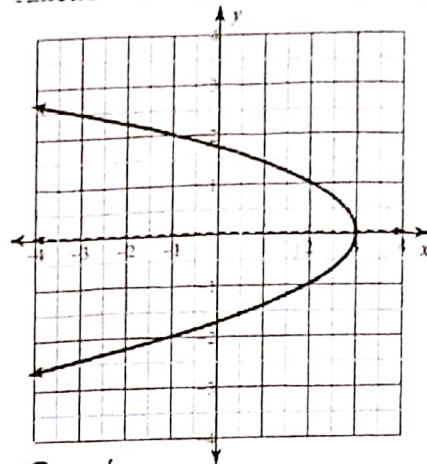
19) Determine if the following relations are functions:

a)



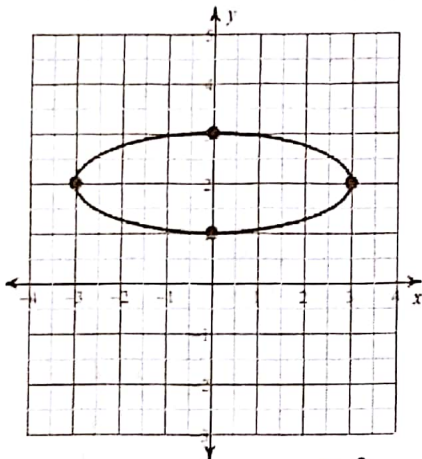
Function

b)



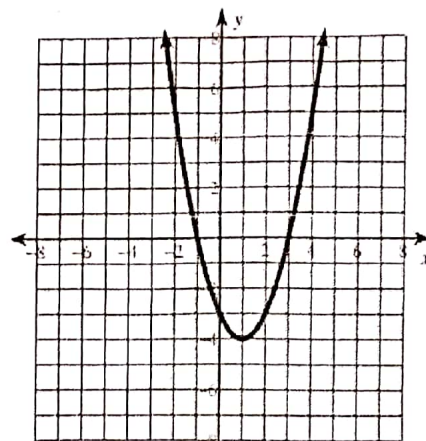
Relation

c)



Relation

d)



Function

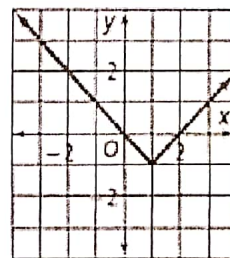
20) State the domain of each of the following:

$$\{(1, -2), (-2, 0), (-1, 2), (1, 3)\}$$

a)

$$\{1, -2, -1, 1\}$$

b)



$$(-\infty, \infty)$$