

Name: Key

Math 121 College Algebra - Crawford

Quiz 2-A(1)

22 February 2017

Books and notes (in any form) are not allowed. You may use a calculator (CALCULATOR NUMBER: _____). Show all work for full credit and clearly indicate your answers. Good Luck!

The following formula may or may not be helpful. $(x - h)^2 + (y - k)^2 = r^2$

1. (2 pts) Determine whether the following equation has symmetry with respect to the origin. [You must show work and clearly state your conclusion.]

$$y = \frac{x}{x^2 + 1}$$

$$\Delta \quad \begin{array}{l} x \rightarrow -x \\ y \rightarrow -y \end{array}$$

same

$$\Rightarrow -y = \frac{-x}{(-x)^2 + 1} \Rightarrow -y = \frac{-x}{x^2 + 1} \Rightarrow y = \frac{x}{x^2 + 1}$$

Mult. both sides by (-1)

\Rightarrow Yes, it is symmetric w/ respect to the origin

2. (2 pts) Write the standard form of the equation of the circle with center $(-3, 0)$ and radius 2.

$$(x - (-3))^2 + (y - 0)^2 = 2^2$$

(h, k) r

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

3. (3 pts) Solve the following equation for x . If there is no solution or infinitely many solutions, clearly state so.

$$-2(x + 3) + 4 = 2x - 5$$

$$-2x - 6 + 4 = 2x - 5$$

$$\begin{array}{r} -2x - 2 = 2x - 5 \\ -2x \qquad -2x \\ \hline \end{array}$$

$$\begin{array}{r} -4x - 2 = -5 \\ +2 \qquad +2 \\ \hline -4x = -3 \end{array}$$

$$\frac{-4x}{-4} = \frac{-3}{-4}$$

$$x = \frac{3}{4}$$

4. (4 pts) Solve the following equation for x . If there is no solution or infinitely many solutions, clearly state so.

$$\frac{x}{x-3} - \frac{3}{x-3} - 2 = 0$$

Note: $x \neq 3$

Method 1

$$(x-3) \left(\frac{x}{x-3} - \frac{3}{x-3} - 2 \right) = 0 \cdot (x-3)$$

$$\cancel{(x-3)} \cdot \frac{x}{\cancel{(x-3)}} - \cancel{(x-3)} \cdot \frac{3}{\cancel{(x-3)}} - 2(x-3) = 0$$

$$x - 3 - 2(x-3) = 0$$

$$x - 3 - 2x + 6 = 0$$

$$-x + 3 = 0 \Rightarrow -x = -3 \Rightarrow x = 3 \Rightarrow \boxed{\text{No Solution}}$$

But $x \neq 3$

Method 2

$$\frac{x}{x-3} - \frac{3}{x-3} - 2 = 0$$

LCD already

$$\frac{\cancel{(x-3)}}{\cancel{(x-3)}} - 2 = 0$$

$$1 - 2 = 0$$

$$-1 = 0 \text{ False Statement}$$

$$\Rightarrow \boxed{\text{No Solution}}$$

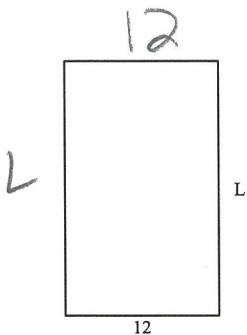
5. (4 pts) 100 feet of fencing will be used to enclose a rectangular animal pen. The width of the pen must be 12 feet. See the figure below. Complete the steps below to find the length of the pen.

- (a). Write down a mathematical model for the problem. [You must write down a mathematical model for full credit.]
[Hint: The amount of fencing is the perimeter.]

$$2L + 2(12) = 100$$

$$\boxed{2L + 24 = 100}$$

- (b). Solve the mathematical model, to find the length of the pen.



$$2L + 24 = 100$$

$$2L = 76$$

$$L = \frac{76}{2} = 38 \Rightarrow \boxed{38 \text{ ft}}$$