

Name: Key

Math 121 College Algebra - Crawford

Quiz 2-B(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.]

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

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

$$-y = \frac{-x}{(-x)^2 + 1} \Rightarrow -y = \frac{-x}{x^2 + 1} \xrightarrow{\text{mult both sides by } (-1)} (-1)(-y) = -1 \cdot \frac{-x}{x^2 + 1} \Rightarrow y = \frac{x}{x^2 + 1}$$

same

Yes, it is symmetric w/ respect to the origin

2. (2 pts) Write the standard form of the equation of the circle with center $(0, -7)$ and radius 8.

$$(x - 0)^2 + (y - (-7))^2 = 8^2$$

(h, k) r

$$x^2 + (y + 7)^2 = 64$$

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

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

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

$$3x - 4 = -3x - 1$$

$$\begin{array}{r} +3x \qquad \qquad +3x \\ \hline \end{array}$$

$$6x - 4 = -1$$

$$\begin{array}{r} +4 \qquad \qquad +4 \\ \hline \end{array}$$

$$6x = 3$$

$$x = \frac{3}{6}$$

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

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

$$\frac{x}{x-2} - \frac{2}{x-2} - 6 = 0$$

⚡ Note: $x \neq 2$

Method 2:

$$\frac{x}{x-2} - \frac{2}{x-2} - 6 = 0$$

LCD already

$$\frac{x-2}{x-2} - 6 = 0$$

$$1 - 6 = 0$$

$$-5 = 0 \text{ False statement}$$

⇒ No Solution

Method 1:

$$(x-2) \left(\frac{x}{x-2} - \frac{2}{x-2} - 6 \right) = 0 \cdot (x-2)$$

$$\cancel{(x-2)} \cdot \frac{x}{\cancel{x-2}} - \cancel{(x-2)} \cdot \frac{2}{\cancel{x-2}} - 6(x-2) = 0$$

$$x - 2 - 6x + 12 = 0$$

$$-5x + 10 = 0$$

$$-5x = -10$$

$$x = \frac{-10}{-5} \Rightarrow x = 2 \Rightarrow \text{No Solution}$$

⚡ But $x \neq 2$

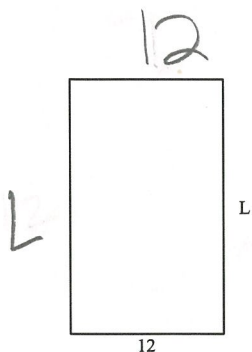
5. (4 pts) 76 feet of fencing will be used to enclose a rectangular animal pen. The width of the pen must be 12 feet. See the figure below. Complete the steps below to find the length of the pen.

- (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.]

$$2L + 2(12) = 76$$

$$2L + 24 = 76$$

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



$$\begin{array}{r} 2L + 24 = 76 \\ -24 \quad -24 \\ \hline 2L = 52 \end{array}$$

$$2L = 52$$

$$L = \frac{52}{2} = 26$$

$$26 \text{ ft}$$