

Name \_\_\_\_\_ Date \_\_\_\_\_  
MAT 1275CO – Mr. Kan Fall 2023 Take Home Test #2

**Show All Work. Please Put a Box Around Your Final Answer. Good Luck!**

1) a) Evaluate the logarithm without using a calculator.  
 $\text{Log}_5(3125)$

b) Solve the equation and round your answer to 3 decimal places.  
 $5^{2x} = 253$

2) Perform the indicated operation and express your answer in simplest form.

$$\frac{x+5}{x-3} + \frac{-7x-27}{x^2-9}$$

Circle one. This problem presents an: expression or equation

3) a) Condense the expressions into a single logarithm.

$$15\text{Log}(x) - 8\text{Log}(y)$$

3) b) Translate to a radical and evaluate  $4096^{\frac{3}{4}}$

4) Simplify the complex fraction.

$$\frac{\frac{6}{y^2} + \frac{1}{y}}{\frac{36}{y^2} - 1}$$

Verify your answer by selecting a non-zero value for x and substituting into both your answer and the original expression.

5) Solve the equation and **check your answer(s)**.

$$\frac{2}{x+3} - 2 = \frac{4}{x+3}$$

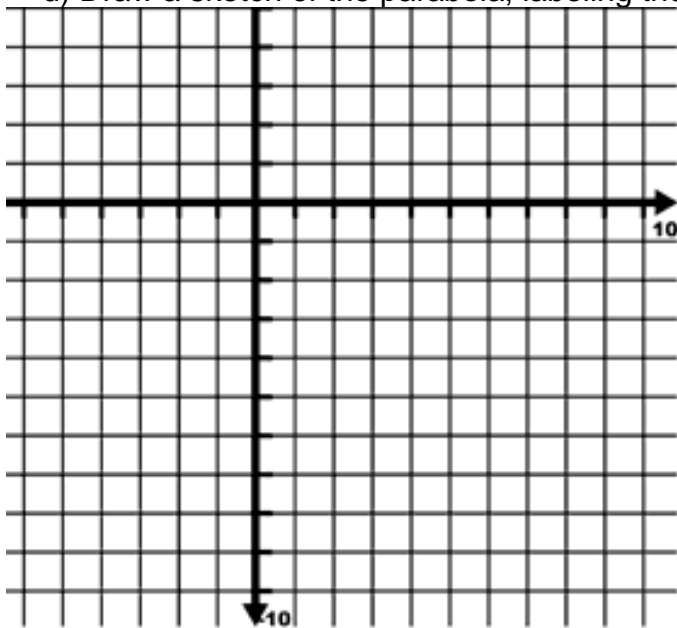
6) For  $y = x^2 - 6x + 2$ ,

a) Find the roots of the parabola in simplest form. Roots: \_\_\_\_\_

b) Find the vertex of the parabola. Vertex: \_\_\_\_\_

c) Find the y-intercept: \_\_\_\_\_

d) Draw a sketch of the parabola, labeling the roots, y-intercept, and vertex.



7) a) Solve the equation and **check your answer(s)**.

$$\sqrt{x+3} + 5 = 12$$

b) Rationalize the denominator. Express your answer in simplest form.

$$\frac{24}{\sqrt{19} - 4}$$

8) a) Perform the indicated operation.

$$7x\sqrt{12x^{15}} - \sqrt{48x^{17}}$$

b) Simplify.  $\left(\frac{5c^6}{2c^{14}}\right)^4$



9) Solve the nonlinear system of equations. Express answer(s) as ordered pair(s).

$$x^2 + 2y^2 = 11$$

$$5x^2 + 2y^2 = 47$$

10) a) Put the equation of the circle in standard form.

$$x^2 - 10y + y^2 - 8x + 20 = 0$$

b) Center: \_\_\_\_\_ Radius: \_\_\_\_\_

c) Graph the circle, labeling 4 points on the circle.

