Test 3 Review MAT 1275 Professor Chiu

Name: _____

- This review consists of **10** questions for a total of **100** points.
- You have **100** minutes to complete the review.
- Show all work and justify your answers.
- Scientific calculators are allowed.
- Wishing you success.

Problem 1 Evaluate the expression.

$$-2^{-3} + 7^0 - 27^{\frac{2}{3}}.$$

Problem 2 Solve

$$x^2 = 6x - 10$$

Problem 3 Simplify the fraction:

$$\frac{\frac{2}{x} + \frac{1}{y}}{\frac{3}{y} - \frac{4}{x}}$$

Problem 4 Divide and simplify:

$$\frac{3 + 4i}{7 + 2i}$$

Problem 5 Solve

$$4\sqrt{2x + 1} - 3 = 17$$

Problem 6 Solve for x:

$$\frac{5}{x - 3} + \frac{x}{x + 4} = \frac{28}{x^2 + x - 12}$$

Problem 7 Find the equation of a line that passes through the points (1,1) and (-4,6).

Problem 8 Given an equation of circle $x^2 + 2x + y^2 - 4y = 1$ and answer the following questions:

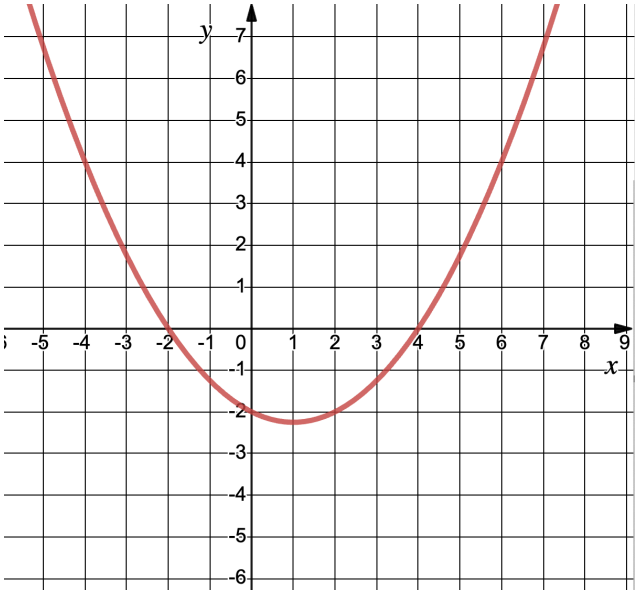
(a) Write this equation in standard form.

(b) Find the center and radius of this circle.

(c) Sketch the circle.

Problem 9 Find an equation representing the relationship between Celsius and Fahrenheit temperature scales noting the freezing point of water is $0°C$ and $32°F$ and boiling point of water is $100°C$ and $212°F$. If it is $74°F$ outside, what is the temperature in Celsius (use your equation)?

Problem 10 Given the graph of $y = ax^2 + bx + c$ and answer the following questions:



(a) Find all solutions to $0 = ax^2 + bx + c$.

(b) What is the value of the constant coefficient c? Justify your answer.

(c) Is the coefficient a, positive, negative or zero? Justify your answer.

(d) How many solutions does the system $\begin{cases} y = ax^2 + bx + c, \\ y = 3. \end{cases}$ have? Justify your answer.

(e) Find the equation for the line of symmetry of the given parabola.