

## Test #2 (Part 2, Calculator Okay)

Math 71B, Prof. Beydler

Name: \_\_\_\_\_

Thursday, April 24, 2014

**Directions:** Show all work. No books or notes. A **scientific calculator** is allowed. Your desk and lap must be clear (no phones, notebooks, etc.). Please box your answers. Good luck!

1. (2 points) Solve the quadratic equation by using the quadratic formula.

$$2x^2 + 16x - 10 = 0$$

2. (2 points) Calculate the discriminant of the following quadratic equation. Then circle the kinds of solutions for the equation.

$$4x - 3 = -2x^2$$

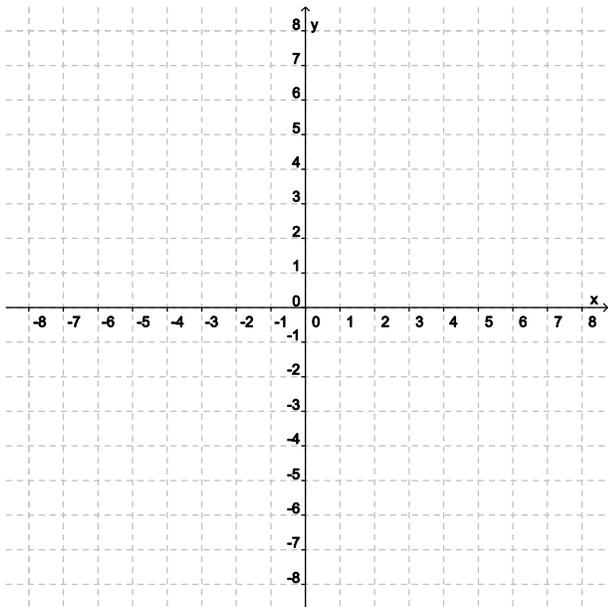
2 rational solutions OR 2 irrational solutions OR 1 rational solution (repeated) OR 2 imaginary solutions

3. (3 points) Solve the following quadratic equation using any method.

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

4. (4 points) Find the vertex,  $x$ -intercepts, and  $y$ -intercept of the following quadratic function. Then graph it below.

$$f(x) = -(x + 2)^2 + 3$$



5. (2 points) Find the vertex of the following quadratic function. Give both  $x$  and  $y$  coordinates.

$$h(x) = 2x^2 - 8x + 3$$

6. (3 points) Solve the following equation.

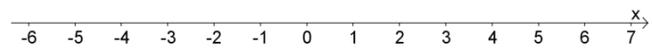
$$x^4 - 8x^2 + 12 = 0$$

7. (3 points) Solve the following equation.

$$x + \sqrt{x} - 6 = 0$$

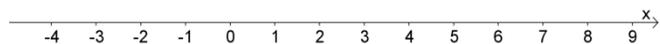
8. (3 points) Solve the inequality and graph the solution set on a real number line.

$$x^2 - 3x - 10 \geq 0$$



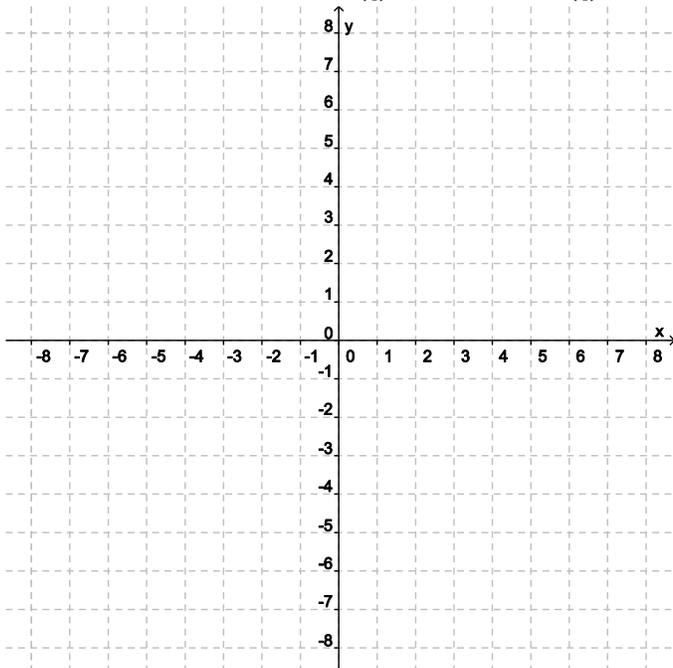
9. (3 points) Solve the inequality and graph the solution set on a real number line.

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



10. (3 points) You have 200 feet of fencing to enclose a rectangular plot that borders on a river. If you do not fence the side along the river, find the length and width of the plot that will maximize the area. Also, what is the largest area that can be enclosed?

11. (3 points) Graph  $f(x) = \left(\frac{1}{4}\right)^x$  and  $g(x) = \left(\frac{1}{4}\right)^{x-3}$ . How is the graph of  $g$  related to the graph of  $f$ ?

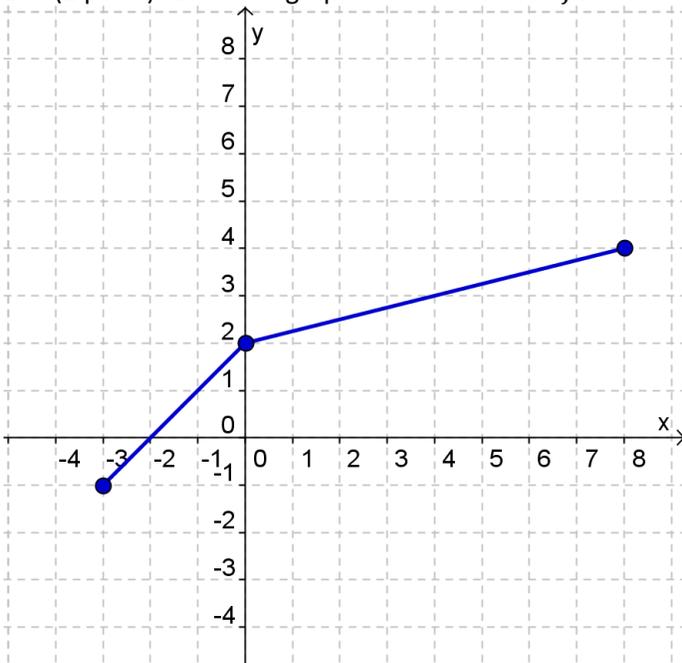


12. (2 points) Let  $f(x) = 5x + 6$  and  $g(x) = x^2 - 1$ . Find  $(g \circ f)(x)$ . Be sure to simplify your answer.

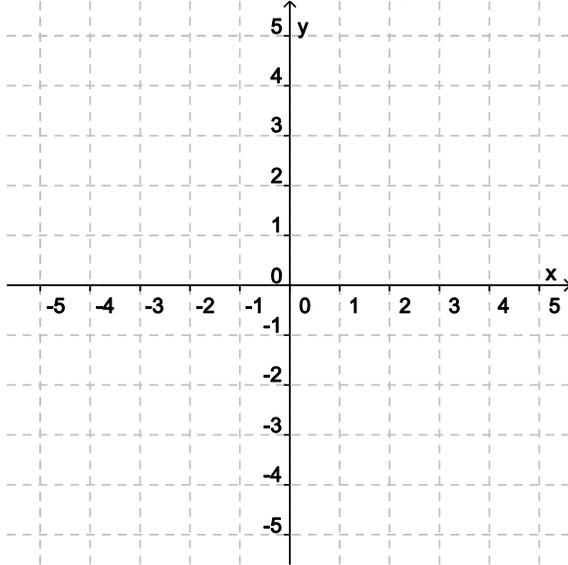
13. (3 points) Find the inverse of  $f(x) = (x + 2)^3$

14. (3 points) Are  $f(x) = \frac{3}{x-4}$  and  $g(x) = \frac{3}{x} + 4$  inverses of each other? Show by finding  $f(g(x))$  and  $g(f(x))$ .

15. (1 point) Draw the graph of the inverse of  $f$ .



16. (2 points) Graph  $f(x) = \log_4 x$



17. (1 point) What is the domain of  $f(x) = \log(2 - x)$ ?

18. (3 points) Use the properties of logarithms to expand the logarithmic expression as much as possible.

$$\log_b \left( \frac{\sqrt{xy^3}}{z^3} \right)$$

19. (1 point) Evaluate to four decimal places:  $\log_3 19$

Q: What is the tallest building at Mt. SAC?

A: The library. (It has the most stories.)

Note: Be sure to double check your work. And don't forget to turn in your homework! 😊