

Quadratics 1b – Introduction to Quadratics
Concavity & y-intercept
Homework #8

1. For the following quadratic functions,
- first, indicate if its graph will be concave up or concave down;
 - then, determine the y-intercept of the graph.

a. $f(x) = 3x^2 - 4x - 5$

b. $f(x) = \frac{1}{2}x^2 - 4x - \frac{3}{7}$

c. $f(x) = 3 - 4x^2 - 2x$

d. $f(x) = x - 2 - \frac{1}{2}x^2$

2. Which of the following functions will have a skinner graph? Briefly explain why you selected that function.

$$f(x) = \frac{1}{2}x^2 + \frac{3}{2}x - \frac{1}{2}$$

or

$$g(x) = \frac{2}{3}x^2 + \frac{1}{2}x - \frac{1}{6}$$

3. Which of the following functions will have a wider graph? Briefly explain why you selected that function.

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

or

$$g(x) = x - \frac{3}{4}x^2$$

(continued...)

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4. Fill in the leading coefficient with a number so that the graph of the resulting quadratic will be **concave down**. There is more than one possible correct answer.

$$f(x) = \underline{\quad}x^2 + x - 6$$

5. Write a function, $f(x)$, to create a quadratic function with a y -intercept of $(0, 6)$.
6. A ball is thrown out of a building window. The path of the ball could be modeled by the function

$$f(t) = -16t^2 + 2t + 25$$

where $f(t)$ represents the height, in feet, of ball t seconds after the ball was thrown.

- a. By simply analyzing the function, determine the y -intercept of the graph of $f(t)$.
(Note: you do **not** have to evaluate or graph the function.)
- b. Interpret what the y -intercept means in the context of the given situation.

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(Note: you do **not** have to evaluate or graph the function.)
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