

**Math 105 - Homework 5****Name:** \_\_\_\_\_

*In each problem below, find an equation for the line that fits the description.*

1. Passes through  $(1, -2)$  and  $(3, 4)$ .
2. Passes through  $(-4, 5)$  and  $(8, 2)$
3. Has a slope of 5 and crosses the  $x$ -axis at  $x = 3$ .
4. Passes through  $(3, 4)$  with slope of  $-6$ .
5. Find the slope and  $y$ -intercept of the line  $4x + 6y = 24$ .
6. Suppose that there are 4 inches of snow already on the ground when a new snow storm arrives. During the storm, snow falls at a rate of  $2/3$  of an inch per hour. Find a formula for the depth of the snow on the ground ( $y$ ) as a function of the number of hours ( $x$ ) that have passed since the storm started.
7. At this rate, how long would it be until the snow is 1 foot (12 inches) deep?

8. Suppose that the cost for a business to manufacture  $x$  widgets is  $C(x)$  dollars. Explain in words what the following equation means:

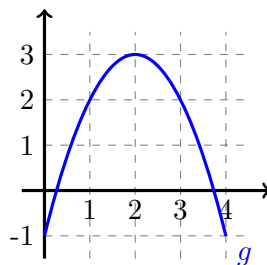
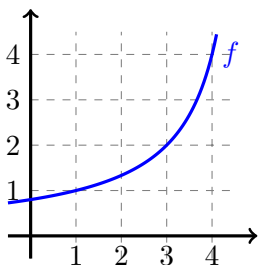
$$C(5,000) = 6,000.$$

Suppose that  $f(x) = \frac{1}{x+2}$  and  $g(x) = 4x + 3$ .

9. Calculate  $f(g(0))$ .

10. Calculate  $g(f(0))$ .

The following graphs show two different functions  $f(x)$  and  $g(x)$ .



Use the graphs to evaluate the following.

11.  $f(g(2))$

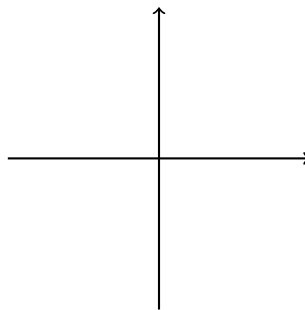
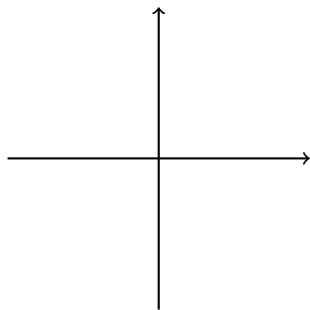
12.  $g(f(1))$

13.  $g(f(4))$

Simplify the following products by expanding. As always, show your work.

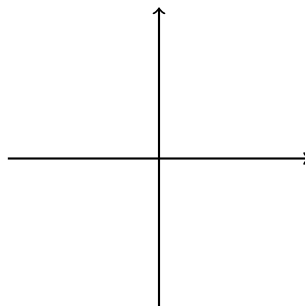
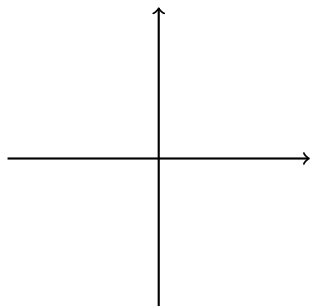
1.  $y = \frac{1}{x-3}$

2.  $y = \sqrt{x} + 3$



3.  $y = \frac{x^2}{4}$

4.  $y = -(x+1)^2$



Solve the following equations.

$$5. \frac{1}{x-3} = 2$$

$$6. \sqrt{x} + 3 = 12$$

$$7. \frac{x^2}{4} = 25$$

$$8. -(x+1)^2 = -9$$

$$9. \frac{5}{x} = \frac{2}{3}$$

$$10. \frac{x}{4-x} = 3$$