

**BLC 190**

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

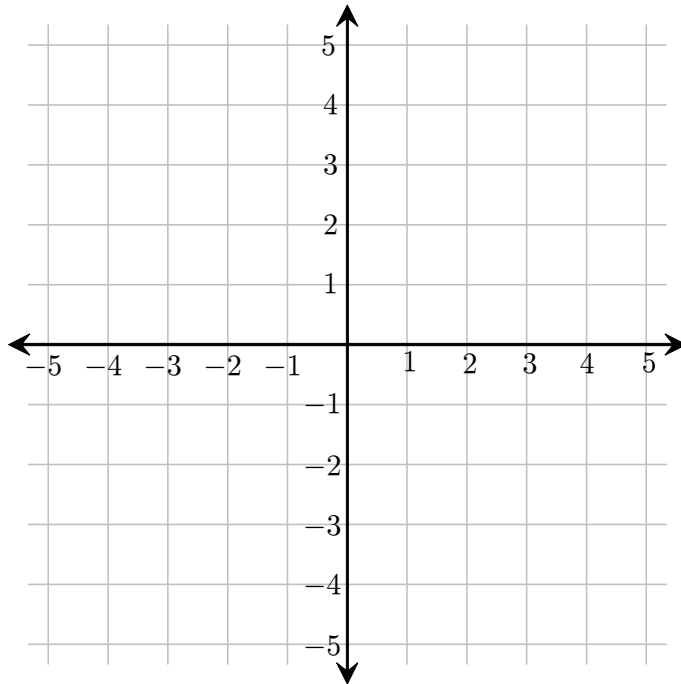
**Homework 2**

1. Suppose that  $f(x) = x^3$  and  $g(x) = \frac{1}{x+3}$ . Evaluate each of the following, simplifying your answers as much as possible:

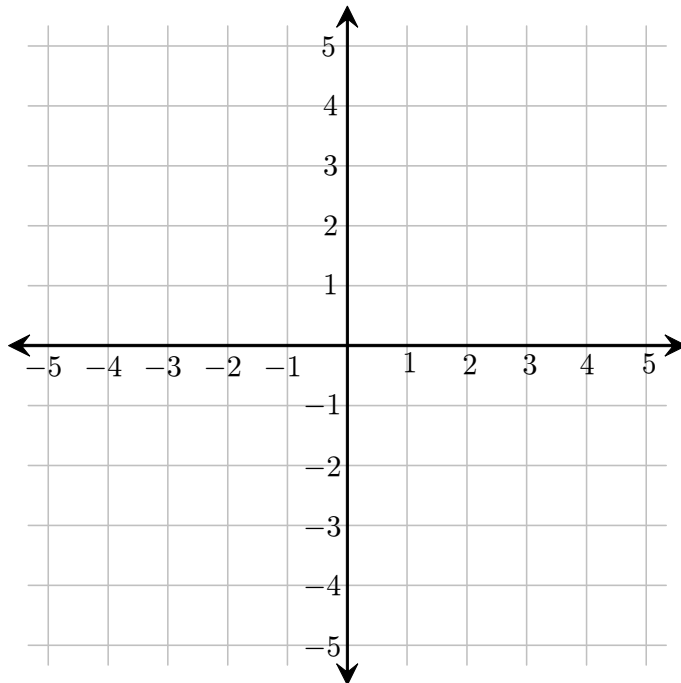
(a)  $\frac{f(a+h) - f(a)}{h}$

(b)  $\frac{g(a+h) - g(a)}{h}$

2. Sketch the graph of  $y = (x + 1)^3 - 2$



3. Sketch the graph of  $y = |x + 2| - 1$



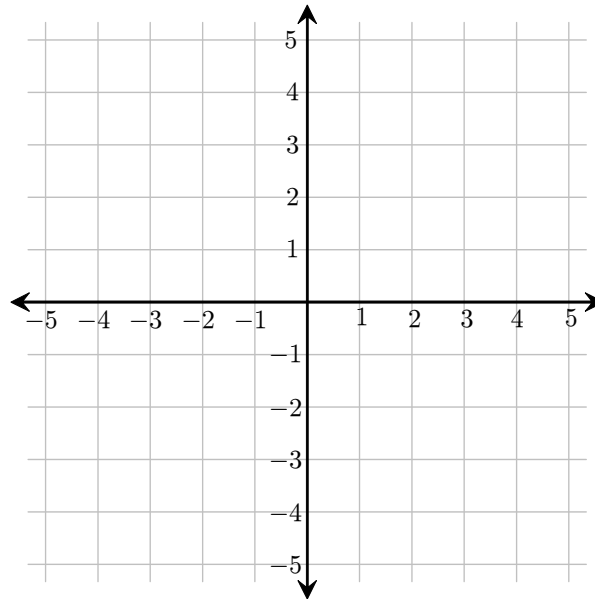
4. Find the equations for the lines through the given points.

(a)  $(-4, 2)$  and  $(-2, 5)$

(b)  $(1, 5)$  and  $(3, -1)$

(c)  $(0, 3)$  and  $(5, 3)$

5. (a) On the following coordinate plane, draw the line with slope  $m = -2$  through the point  $(2, -1)$ .



- (b) Find the equation for the line.

- (c) What is the  $y$ -intercept of the line?

- (d) What is the  $x$ -intercept of the line?

6. Consider the line  $3x + 2y = 5$ .

(a) What is the slope of this line?

(b) What is the  $y$ -intercept of this line?

(c) What is the  $x$ -intercept of this line?

7. Suppose that  $f$  is a **linear function** and that  $f(5) = 9$  and  $f(1) = -3$ .

(a) Find  $f(7)$ .

(b) Find  $a$  so that  $f(a) = 27$ .

8. At age 7, Megan has 18 friends. Starting at age 7, she gains 10 friends a year (and never loses any friends). How many friends does she have at age  $x$ ?
9. Bob bought a car for \$18,500 in 2004. The car is worth \$9,500 in 2009. Assume that the value of the car decreases linearly. What will the car be worth in 2012?
10. A train is traveling to Boston at a constant speed. At 2:00 pm the train is 200 miles from Boston. At 3:30 pm the train is 120 miles from Boston. At what time does the train reach Boston?

11. At age 3, little Jimmy was 3 feet tall. By age 5, he had grown to 3 feet, 5 inches.
- (a) Assuming linear growth, write an equation for Jimmy's expected height (measured in inches) at age  $x$ .
- (b) How tall do you expect Jimmy to be at age 9?
- (c) At what age do you expect Jimmy to be 6 feet tall?