

Worksheet 2

1. Suppose that $f(x) = x^2 + 3x$ and $g(x) = \frac{1}{x}$. Evaluate each of the following, simplifying your answers as much as possible:

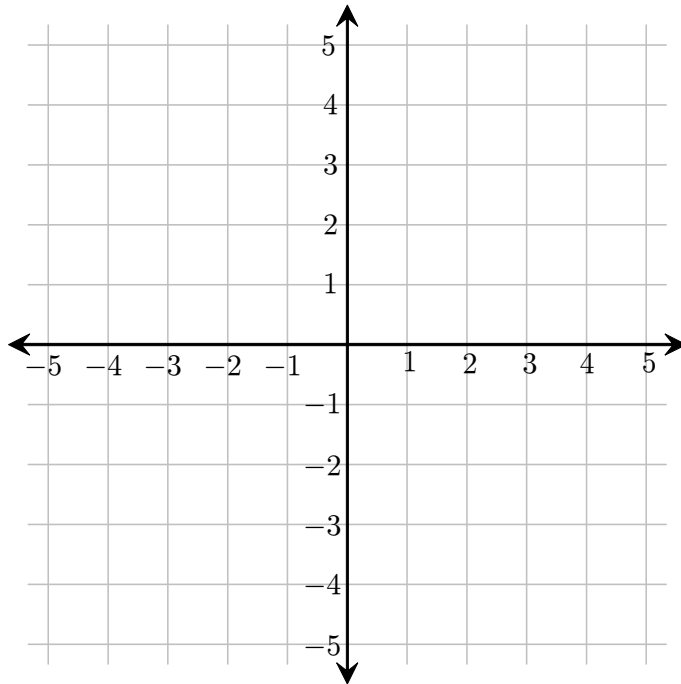
(a) $f(a + b)$

(b) $g\left(\frac{a}{b}\right)$

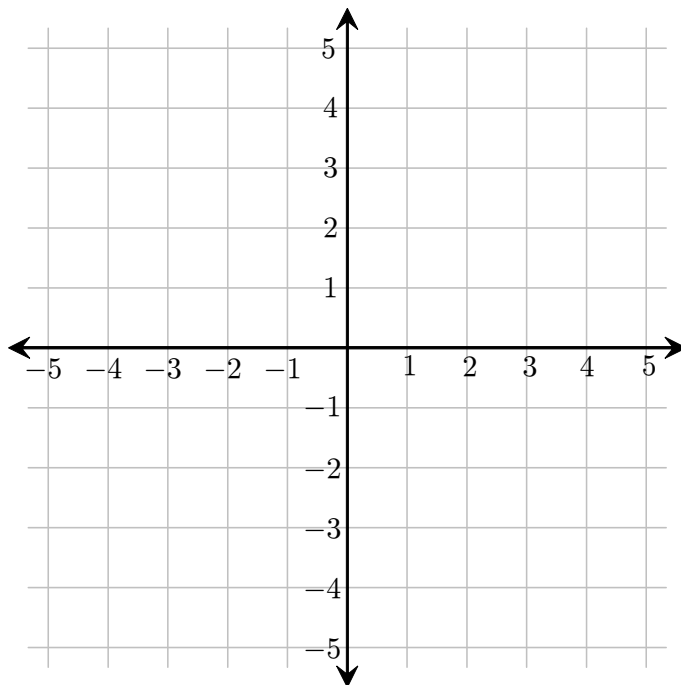
(c) $\frac{f(a + h) - f(a)}{h}$

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

2. Sketch the graph of $y = (x - 1)^2 - 4$



3. Sketch the graph of $y = \sqrt{x + 3} - 2$



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

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

(b) $(-5, 8)$ and $(1, -4)$

(c) $(1, 5)$ and $(3, 5)$

(d) $(-1, 3)$ and $(-1, 8)$

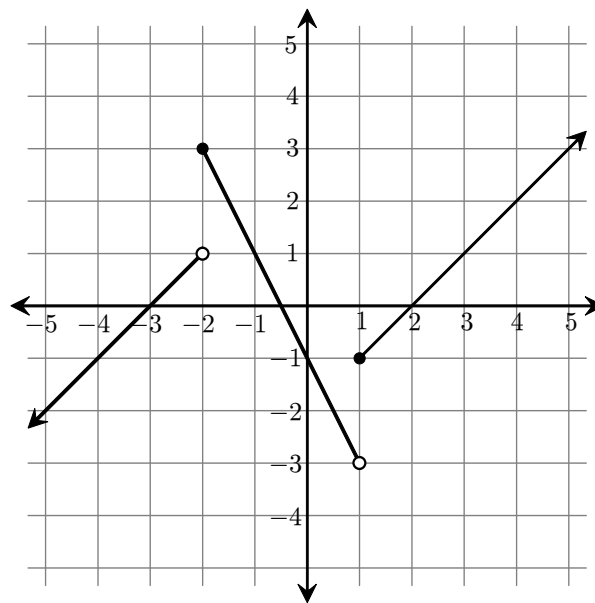
5. Find the equation for the line with slope $m = 3$ through the point $(-1, 5)$.

6. Suppose that f is a linear function and that $f(2) = 3$ and $f(6) = 5$.

(a) Find $f(10)$.

(b) Find a so that $f(a) = 20$.

7. Consider the following function:



Find an expression for this function.

8. At age 3, Jane is 36 inches tall. Starting at age 3, she grows 2 inches a year. How tall is Jane at age n ?

9. An oceanographer is taking undersea temperature readings using a thermistor temperature sensor attached to a Niskin bottle. At a depth of 300 meters, she measures a temperature of 18°C . At a depth of 500 meters, she measures a temperature of 13°C .

(a) Assume that the temperature depends linearly on the the depth. Find a formula for the temperature T at a depth of x meters.

(b) Use your answer to part (a) to estimate the temperature at a depth of 600 meters.

(c) Estimate the depth at which the water temperature is 16°C .

10. In 2005, there were 17.3 million students enrolled in college, and that number was increasing at a rate of 433,000 per year.

(a) Write an equation expressing the relationship between the number of college students and the year.

(b) Estimate the number of college students in 2015.