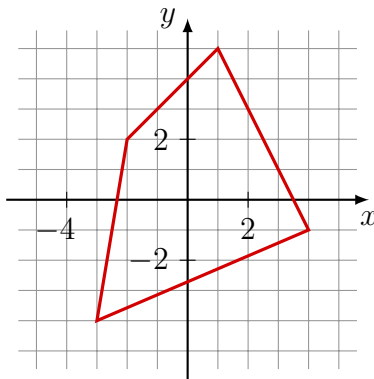1. [10 pts.] Find the slope of the line containing the points $(2, -1)$ and $(-5, -3)$.

2. [10 pts.] Find k so that the line through $(2, 3)$ and $(k, 1)$ is parallel to $2x - y = 1$.

3. [10 pts.] Give the domain and range of the relation given by the graph below. Is the relation a function?

4. [10 pts.] Let $f(x) = -2x + 6$. Find and simplify $f(2t - 1)$.

5. [10 pts.] Find the domain and range of $u(x) = |x - 12| + 9$.

6. [10 pts. each] Find the domain of the function in interval notation.

   (a) $h(x) = \sqrt[4]{x - 6} - 9$

   (b) $\ell(x) = \sqrt{x - 4} + \sqrt{12 - x}$

7. [10 pts. each] Let

$$f(x) = \frac{2}{x + 2} \quad \text{and} \quad g(x) = \frac{x}{x + 2}$$

   (a) Find the domain of f and g.

   (b) Find $f + g$ and its domain.

   (c) Find f/g and its domain.

   (d) Find $f \circ g$ and its domain.

8. [10 pts.] Let

$$r(x) = \sqrt[3]{x - 4}.$$

   Find functions $f \neq r$ and $g \neq r$ such that $f \circ g = r$.

9. 10 pts. Show algebraically that the function $f(x) = 2x^3 - 1$ is one-to-one.

10. 10 pts. Show that $g(x) = 9 - x^2$ is not one-to-one.

11. 10 pts. each The function
$$f(x) = \frac{3x + 1}{x - 3}$$
is one-to-one.

(a) Find the inverse of f.

(b) Find the range of f and the range of f^{-1}.