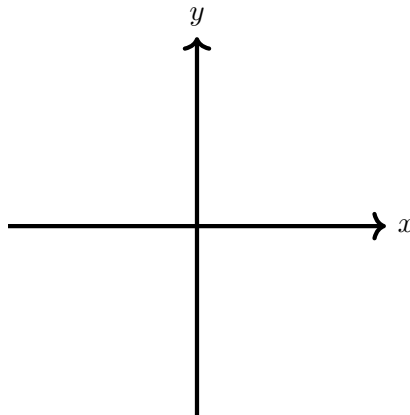


**ALGEBRA 2**  
**PROBLEM SET 02**

DUE DATE: JANUARY 18, 2024

**Question 1.** Let  $f(x) = \frac{2x+8}{x-3}$

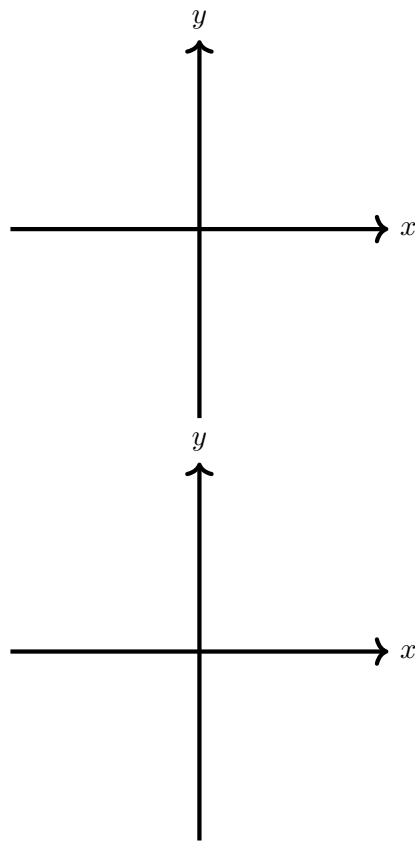
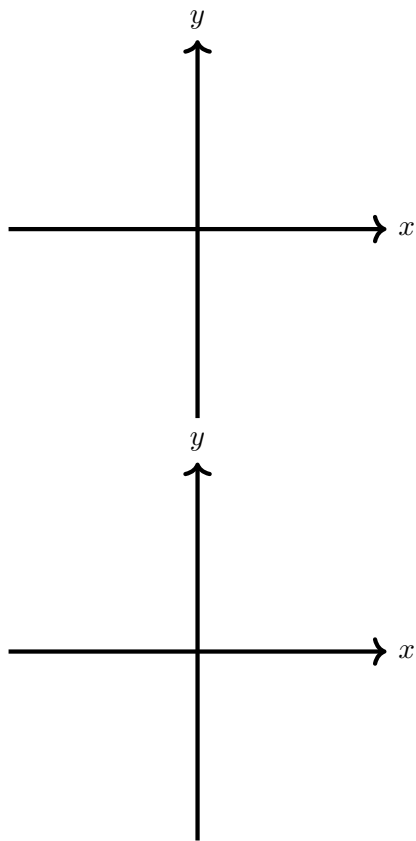
- (1) Domain
- (2)  $(x, y)$ -coordinate of any holes
- (3)  $x$ -intercepts
- (4) Vertical asymptotes
- (5) Horizontal asymptotes, if any
- (6) Graph them using a sign chart!



**Question 2.** Let  $f(x) = \frac{1}{x^2}$ ,  $g(x) = \frac{3x^3 - 12x}{x^4 + 3x^3 + 2x^2}$ ,  $h(x) = \frac{x^2 + 2x + 1}{x^2 + 10x + 9}$ , and  $k(x) = \frac{2x^2 + 4x + 2}{x^2 + 2x + 1}$ .

For each of these functions, find the

- (1) Domain
- (2)  $(x, y)$ -coordinate of any holes
- (3)  $x$ -intercepts
- (4) Vertical asymptotes
- (5) Horizontal asymptotes, if any
- (6) Graph them using a sign chart!



**Question 3.** Let  $f(x) = \frac{5}{(x-1)^2} + x - 2$

- (1) Find the domain
- (2) Find the vertical asymptotes
- (3) Find the horizontal/oblique asymptotes, if they exist
- (4) Find the coordinates of any holes
- (5) Find the  $x$ -intercepts
- (6) Sketch a graph

