

#11 D Pre-Calculus Worksheet
Rational Equations Day Two

Name: _____ Per. _____

Describe the place of discontinuity (WHAT AND WHERE).

1. $f(x) = \frac{3x-5}{2x+6} = \frac{3x-5}{2(x+3)}$

VA @ $x = -3$

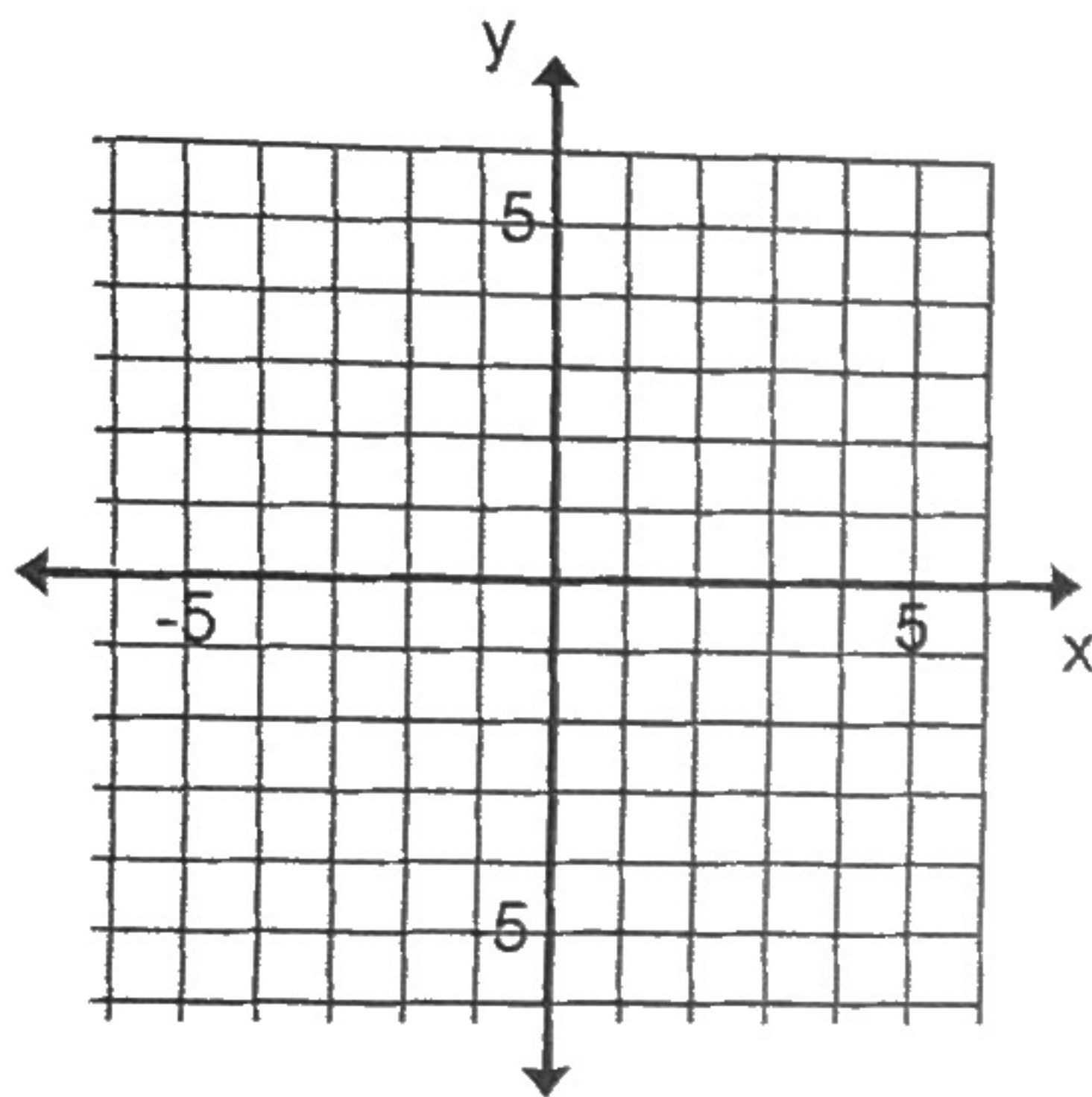
2. $f(x) = \frac{x^2-1}{x+1}$

3. $f(x) = \llbracket x+2 \rrbracket$

jump @ every integer.

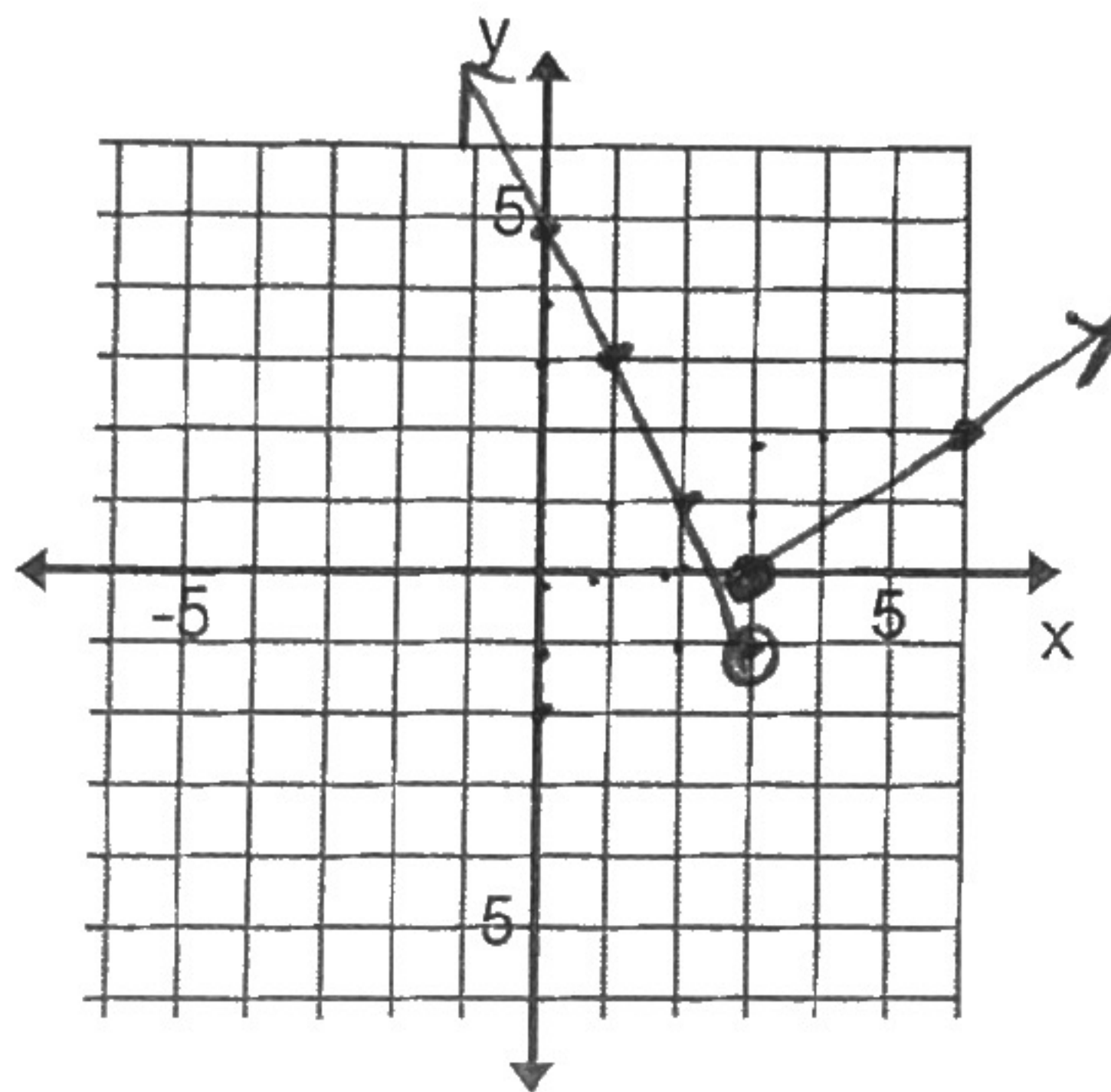
Graph each of the following functions. Then, state the domain and the range of each function.

4. $f(x) = \frac{x^2+4x+3}{x+3}$



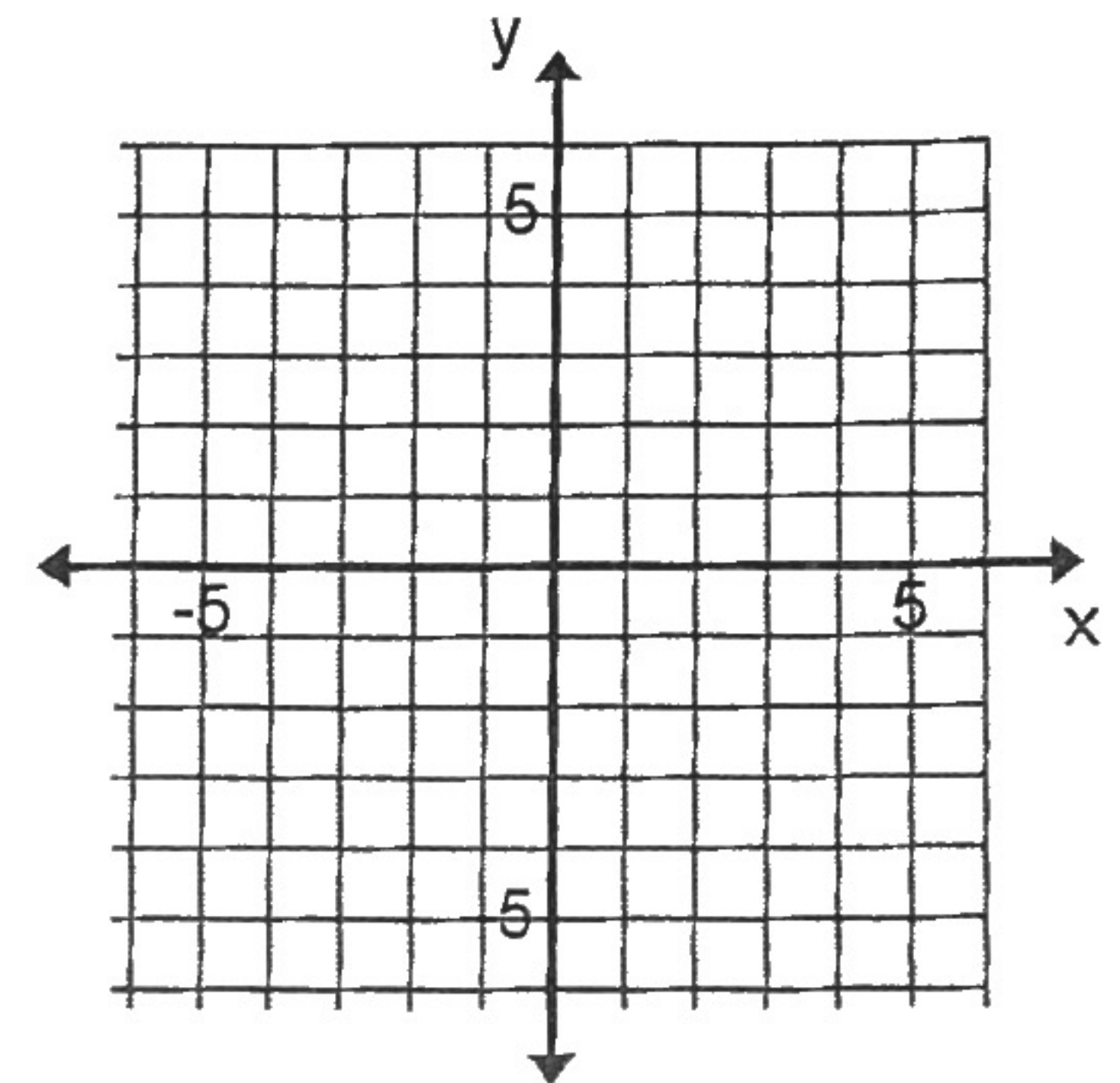
Domain: _____
Range: _____

5. $f(x) = \begin{cases} \frac{2}{3}x - 2, & x \geq 3 \\ -2x + 5, & x < 3 \end{cases}$



Domain: \mathbb{R}
Range: $y > -1$

6. $f(x) = \frac{x^3-4x}{x^2-2x}$



Domain: _____
Range: _____

State the holes, ALL the asymptotes... vertical, horizontal, and slanted (if any) and the x- and y- intercepts.

7. $f(x) = \frac{5-4x}{2x+3} = \frac{-4x+5}{2x+3}$

Hole: NO VA: $x = -\frac{3}{2}$
HA: $y = -2$ SA: NO
x-int: $\frac{5}{4}$ y-int: $\frac{5}{3}$

8. $f(x) = \frac{x^2+4x-2}{x+2}$

Hole: _____ VA: _____
HA: _____ SA: _____
x-int: _____ y-int: _____

9. $f(x) = \frac{4x}{x+3}$

Hole: NO VA: $x = -3$
HA: $y = 4$ SA: NO
x-int: 0 y-int: 0

10. $f(x) = \frac{x^2-5x-6}{x-6}$

Hole: _____ VA: _____
HA: _____ SA: _____
x-int: _____ y-int: _____

11. $f(x) = \frac{3x}{x^2-9} = \frac{3x}{(x+3)(x-3)}$

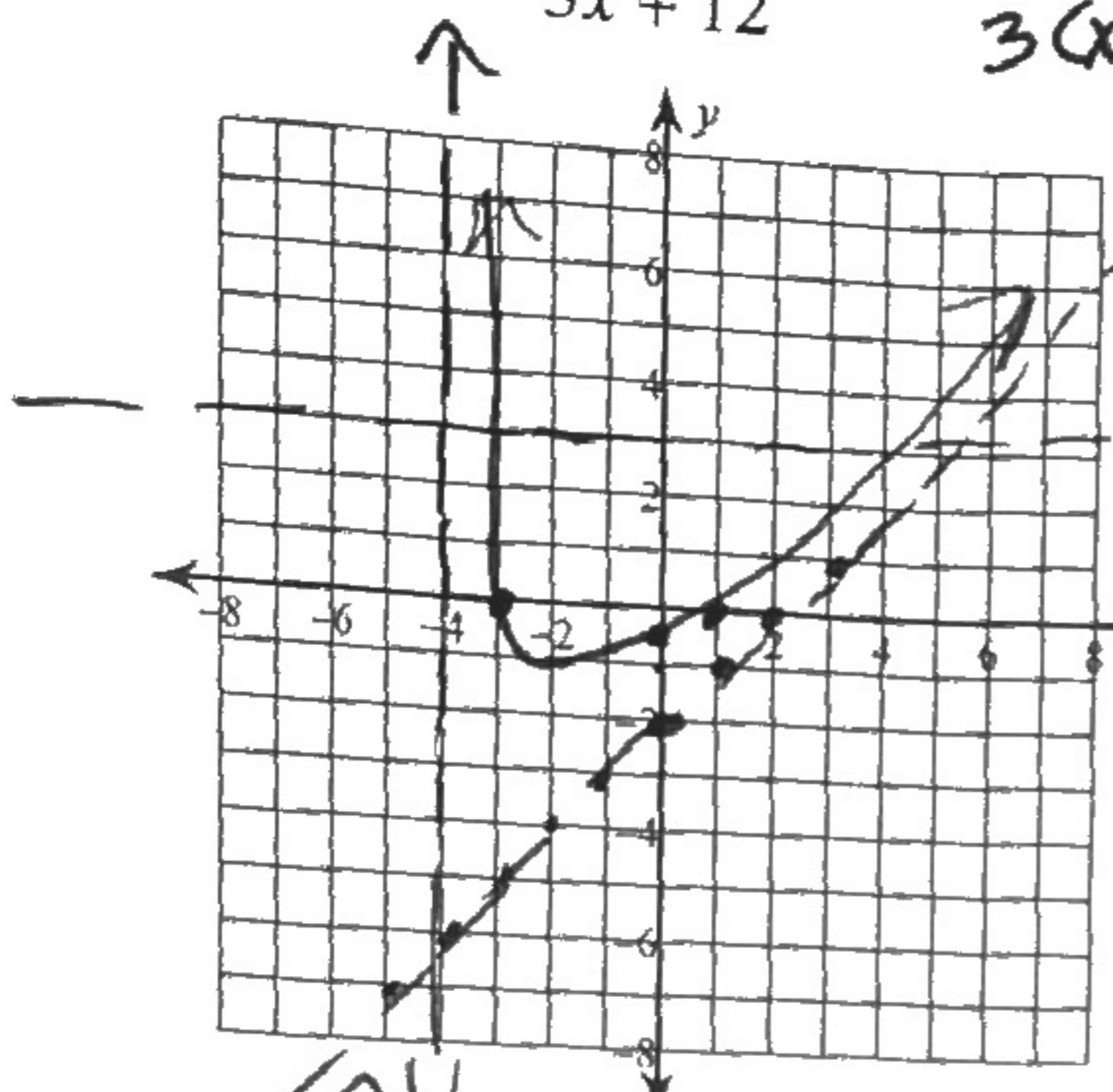
Hole: NO VA: $x = 3; x = -3$
HA: $y = 0$ SA: NO
x-int: 0 y-int: 0

12. $f(x) = \frac{2x^2+3x-1}{2x+1}$

Hole: _____ VA: _____
HA: _____ SA: _____
x-int: _____ y-int: _____

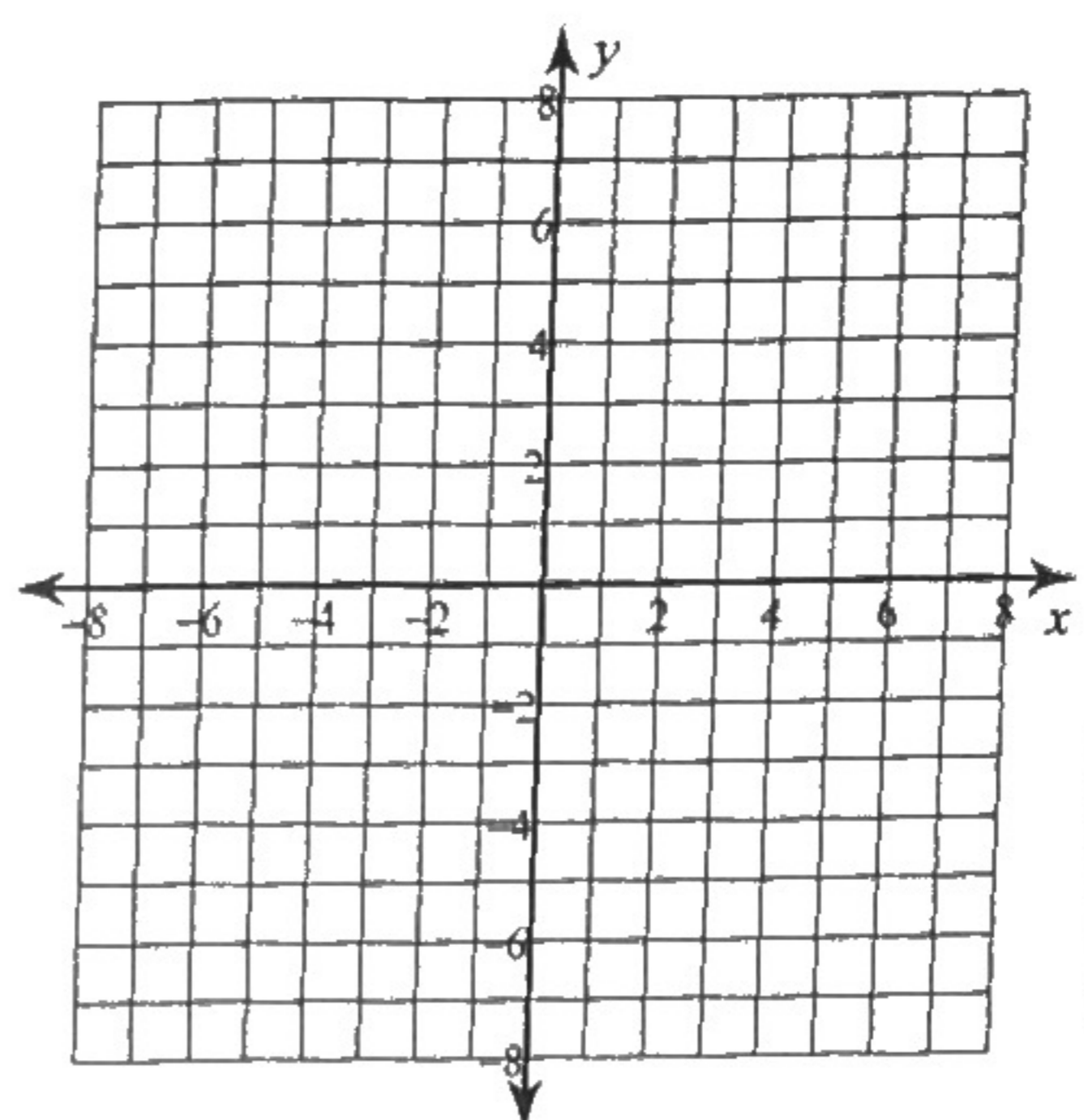
Identify the points of discontinuity, holes, vertical asymptotes, x-intercepts, and horizontal asymptote of each. Then sketch the graph.

13) $f(x) = \frac{x^2 + 2x - 3}{3x + 12} = \frac{(x+3)(x-1)}{3(x+4)}$



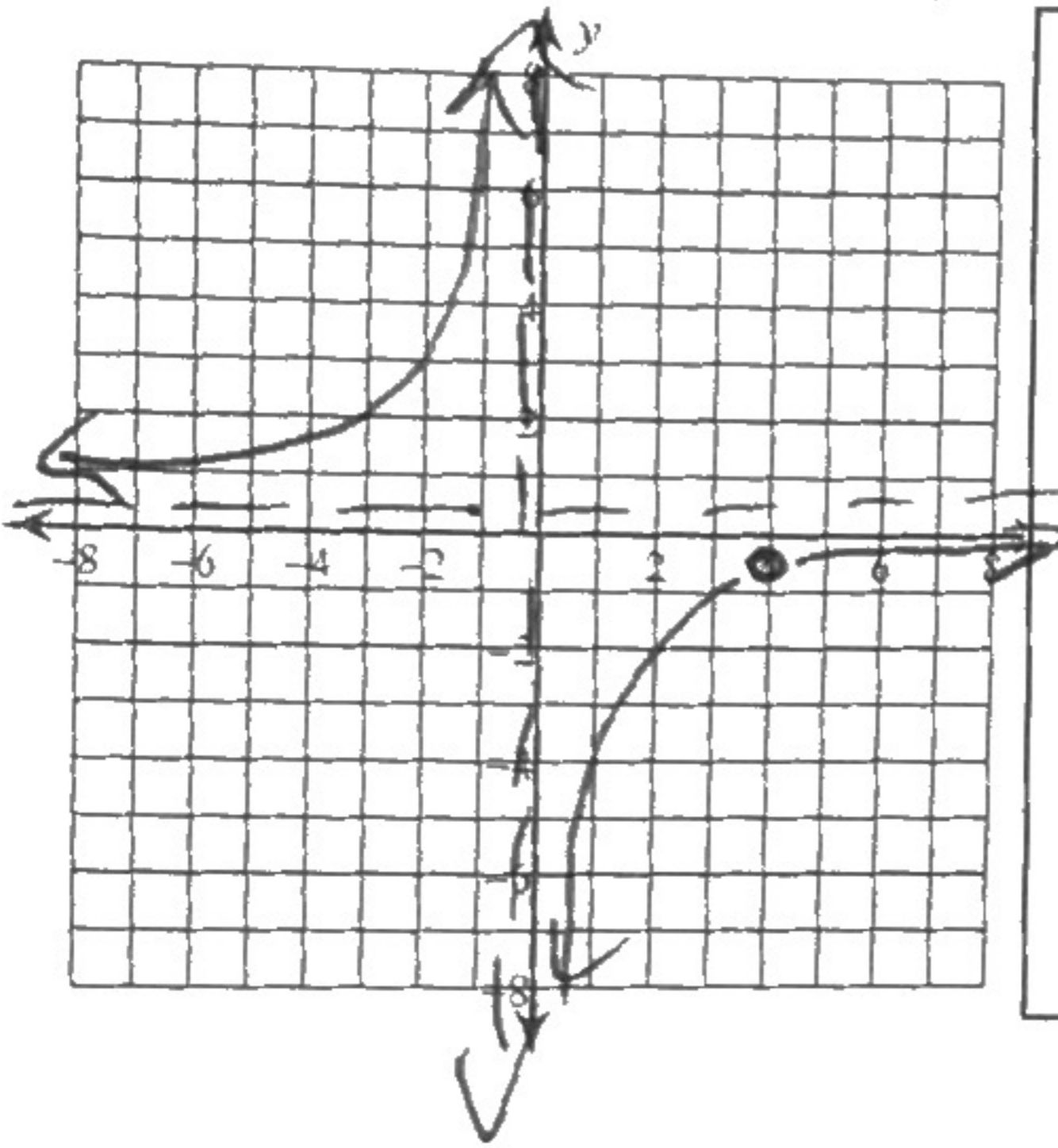
Hole: NO
 VA: x = -4
 HA: NO
 SA: NO
 x-int: -3, 1
 y-int: -1/4
 D: R x ≠ -4
 R: NO

14) $f(x) = \frac{x^3 + x^2 - 12x}{4x^2 - 4x - 24}$



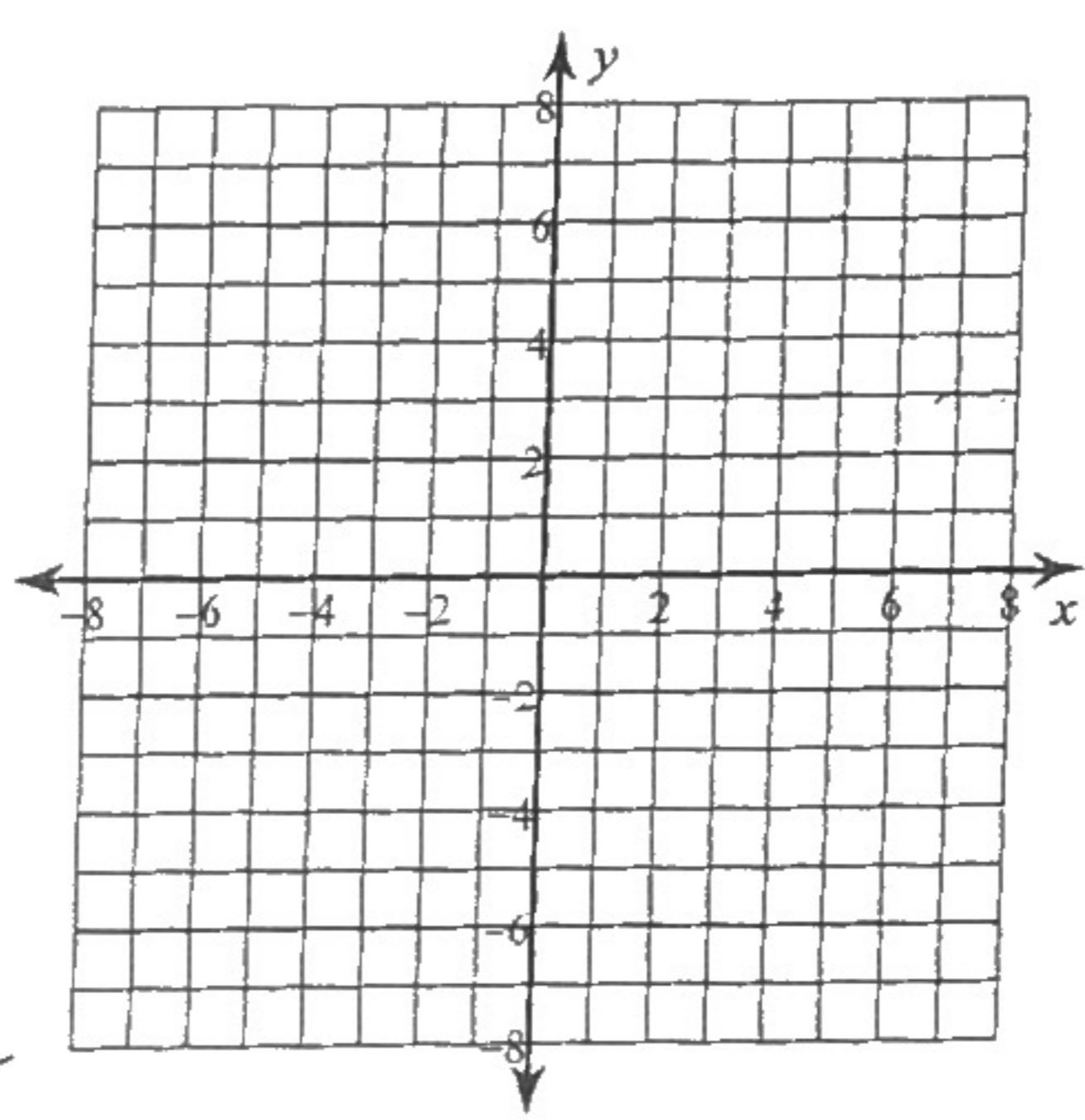
Hole: _____
 VA: _____
 HA: _____
 SA: _____
 x-int: _____
 y-int: _____
 D: _____
 R: _____

15) $f(x) = \frac{-2x + 8}{x^2 - 4x} = \frac{-2(x-4)}{x(x-4)}$



Hole: (4, -1/2)
 VA: x = 0
 HA: y = 0
 SA: NO
 x-int: NO
 y-int: NO
 D: R: x ≠ 0, 4
 R: R: y ≠ 0, -1/2

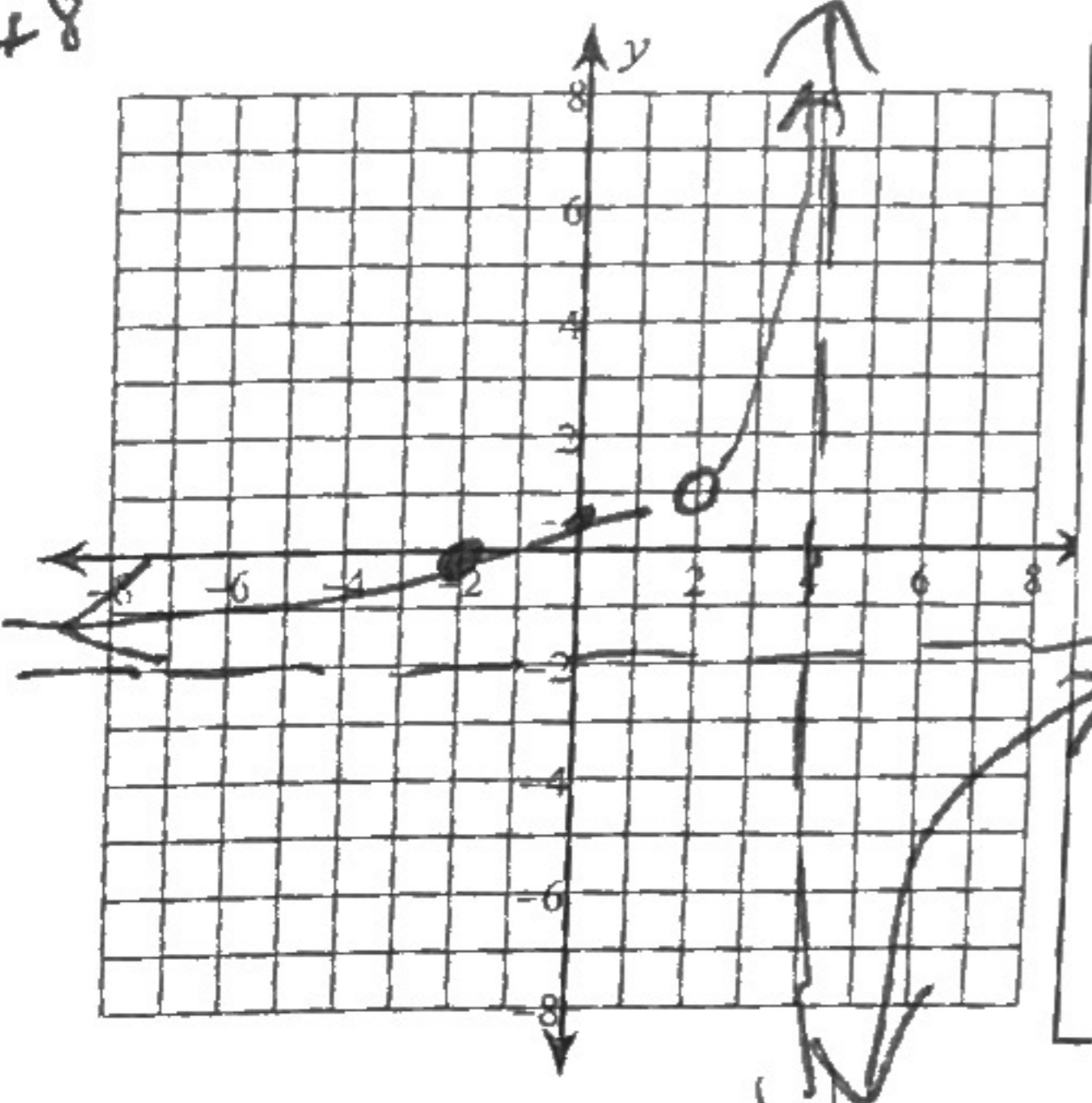
16) $f(x) = \frac{-2x + 6}{x - 1}$



Hole: _____
 VA: _____
 HA: _____
 SA: _____
 x-int: _____
 y-int: _____
 D: _____
 R: _____

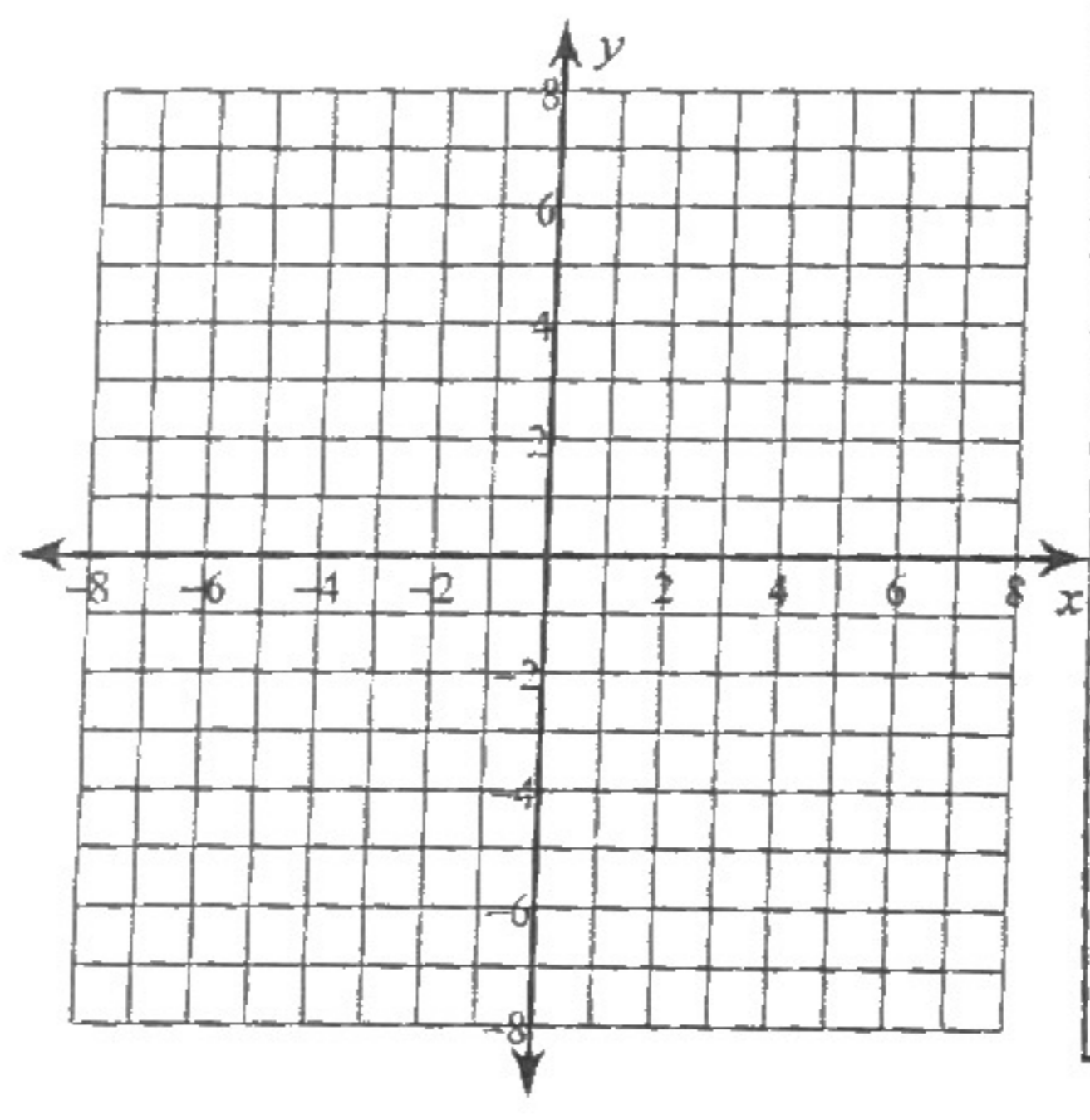
17) $f(x) = \frac{x^2 - 4}{-2x^2 + 12x - 16} = \frac{(x+2)(x-2)}{2(x-2)(x-4)} = \frac{x}{2(x-4)}$

$x^2 - 6x + 8$



Hole: (2, 1/4)
 VA: x = 4
 HA: y = 1/2
 SA: NO
 x-int: -2
 y-int: 1/4
 D: R: x ≠ 2, 4
 R: R: y ≠ 1/2

18) $f(x) = \frac{x^3 - 5x^2 + 4x}{2x^3 - 14x^2 + 24x}$



Hole: _____
 VA: _____
 HA: _____
 SA: _____
 x-int: _____
 y-int: _____
 D: _____
 R: _____