

Station 2 Pre-Calculus Test 4.2 Rational Functions

Solve Each. Remember to CHECK your answers!

Name Kroy Per

1. $\frac{3}{x+8} = \frac{x}{x-2}$

$$3(x-2) = x(x+8)$$

$$3x-6 = x^2+8x$$

$$0 = x^2+5x+6$$

$$0 = (x+2)(x+3)$$

$$\boxed{x = -2 \quad x = -3}$$

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

$$x(x-2) + x(x+1) = 2(x^2-x-2)$$

$$x^2-2x+x^2+x = 2x^2-2x-4$$

$$-x = -2x-4$$

$$\boxed{x = -4}$$

3. $\sqrt{3x+1} = x-3$

$$3x+1 = x^2-6x+9$$

$$0 = x^2-9x+8$$

$$0 = (x-1)(x-8)$$

$$x = 1 \text{ or } 8$$

$$\boxed{x = 8}$$

4. $2\left(\frac{x}{2}\right)^2 - 9\left(\frac{x}{2}\right) - 18 = 0$

$$2u^2 - 9u - 18 = 0$$

$$(u-6)(2u+3) = 0$$

$$u = 6 \quad u = -\frac{3}{2}$$

$$\frac{x}{2} = 6 \quad \frac{x}{2} = -\frac{3}{2}$$

$$\boxed{x = 12 \quad x = -3}$$

$$\begin{array}{r} -36 \\ -12 + 3 \\ \hline 2 \end{array}$$

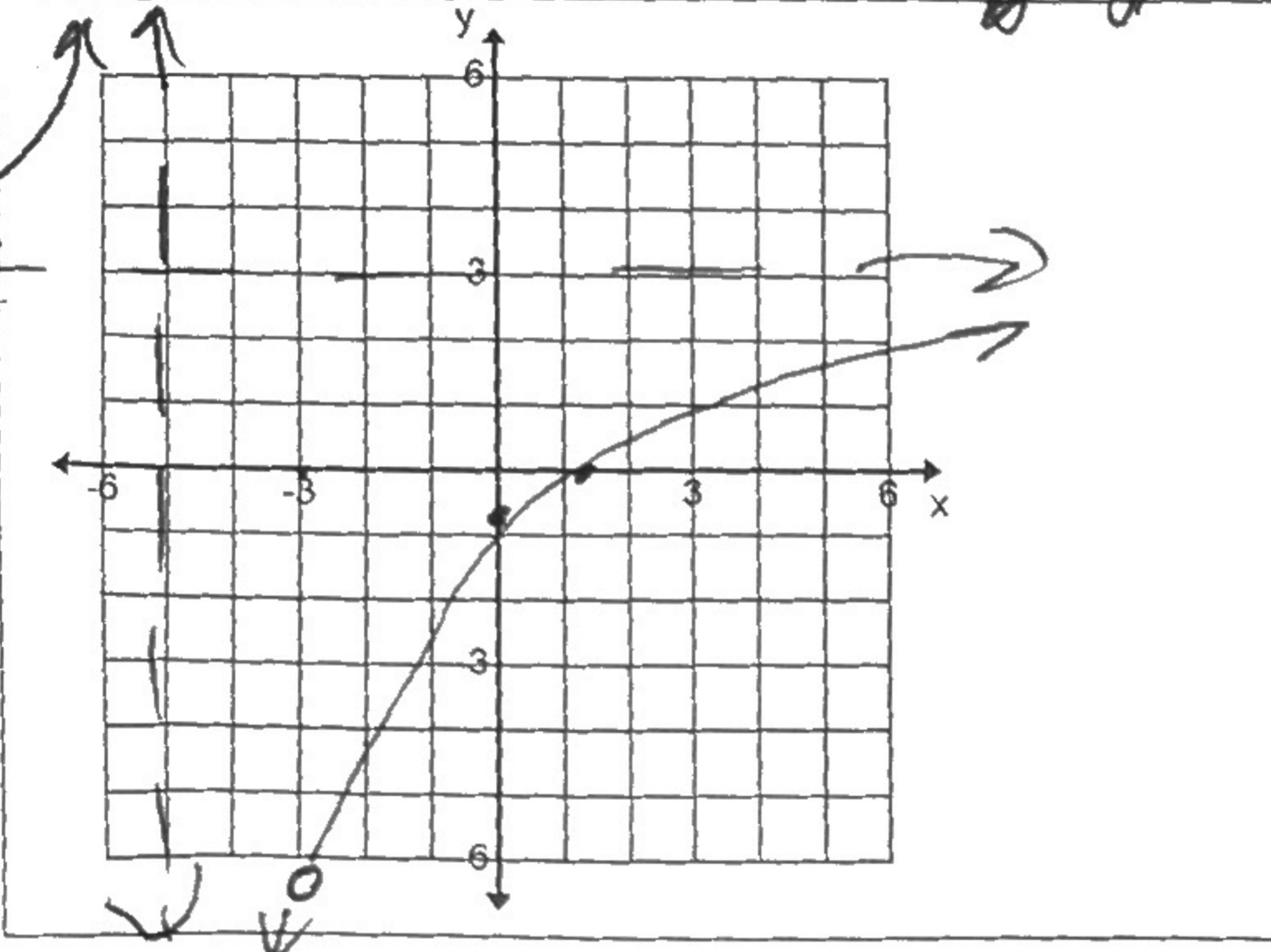
Station 3 Pre-Calculus Test 4.2 Rational Functions

Find each indicated value and graph.

Quiz Name Key Per

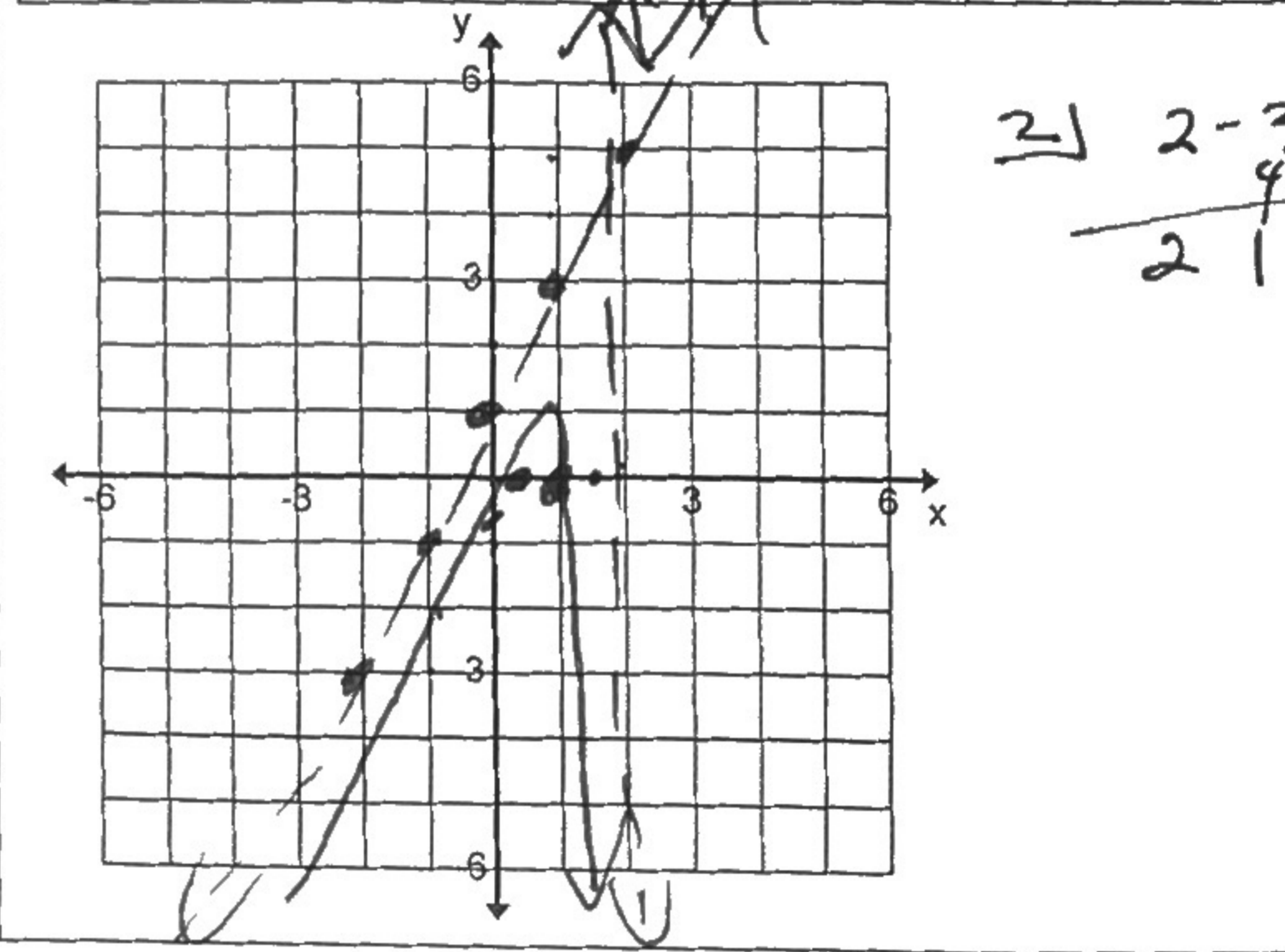
1. $f(x) = \frac{3x^2 + 5x - 12}{x^2 + 8x + 15} = \frac{(3x-4)(x+3)}{(x+3)(x+5)} = \frac{3x-4}{x+5}$ $\frac{-36}{-4+9}$ $\frac{3}{3}$

Hole: $(3, -\frac{13}{2})$	VA: $x = -5$	HA: $y = 3$	SA: NO
x-int: $\frac{4}{3}$	y-int: $-\frac{4}{5}$	Domain: $\mathbb{R} \setminus \{-5\}$	Range: $\mathbb{R} \setminus \{3\}$



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

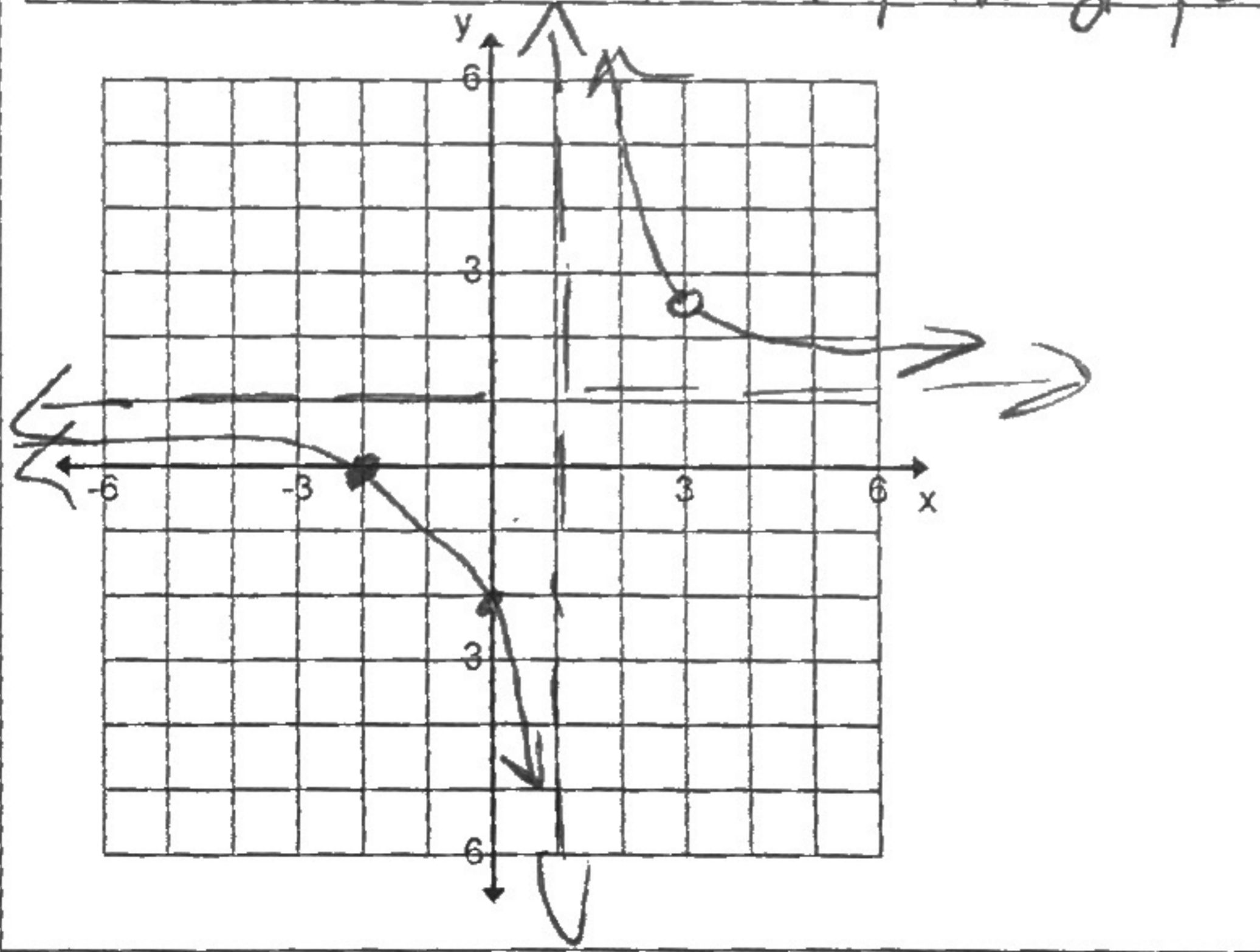
Hole: NO	VA: $x = 2$	HA: NO	SA: $y = 2x + 1$
x-int: $1, \frac{1}{2}$	y-int: $-\frac{1}{2}$	Domain: 	Range:



$\frac{2}{2} \frac{2-3}{4} = \frac{2}{2} = 1$

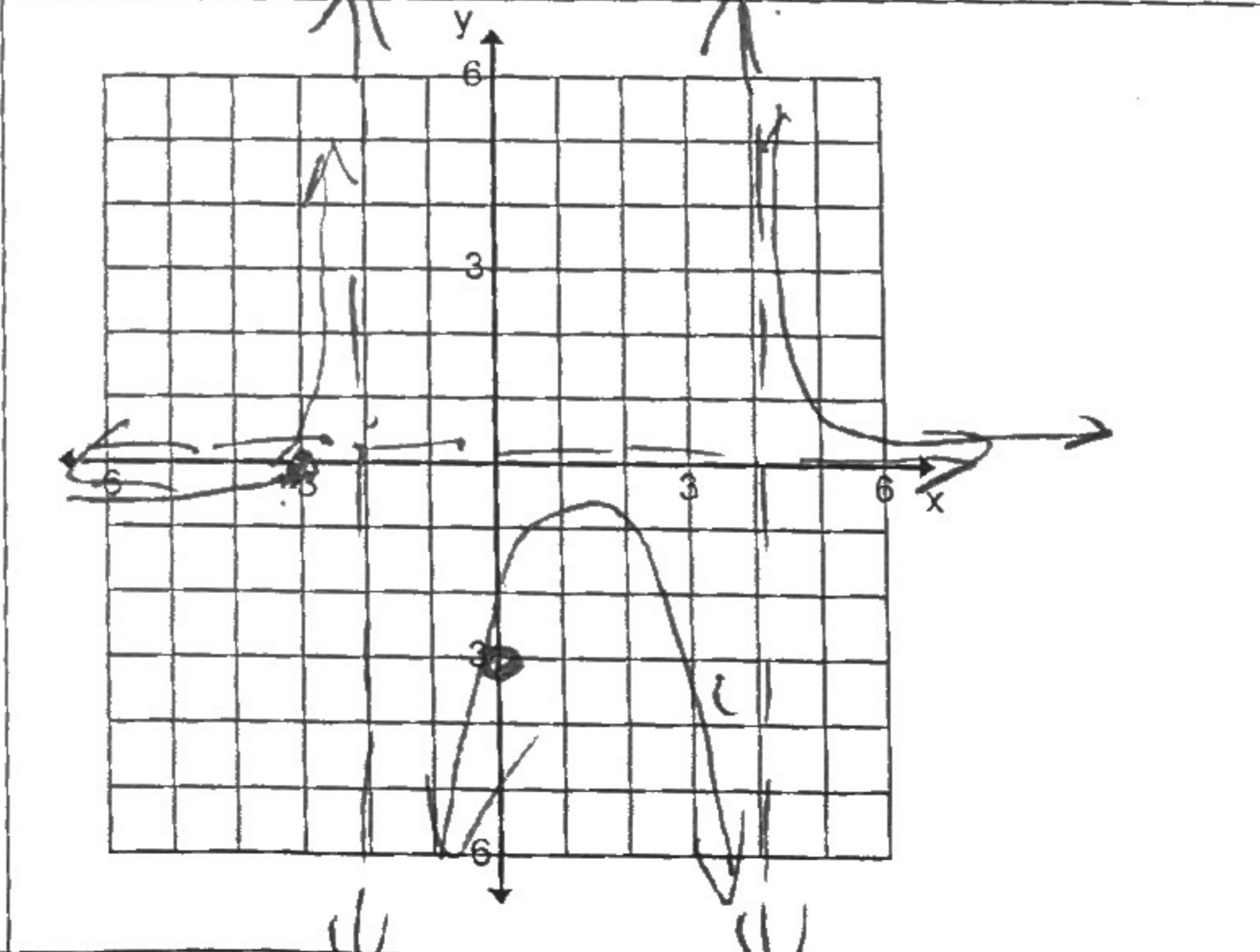
3. $f(x) = \frac{x^2 - x - 6}{x^2 - 4x + 3} = \frac{(x-3)(x+2)}{(x-3)(x-1)} = \frac{x+2}{x-1}$

Hole: $(3, \frac{5}{2})$	VA: $x = 1$	HA: $x = 1$	SA: NO
x-int: -2	y-int: -2	Domain: $\mathbb{R} \setminus \{1, 3\}$	Range: $\mathbb{R} \setminus \{1, \frac{5}{2}\}$



4. $f(x) = \frac{x+3}{x^2 - 2x - 8} = \frac{x+3}{(x-4)(x+2)}$

Hole: NO	VA: $x = 4$ $x = -2$	HA: $y = 0$	SA: NO
x-int: -3	y-int: $-\frac{3}{8}$	Domain: 	Range:



Station 4 Pre-Calculus Test 4.2 Rational Functions
 Determine the TYPE (hole, asymptote, jump, or None) of discontinuity and the LOCATION.

Name Koey Per

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

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

Type: hole

Location: $(-3, -7)$

2. $f(x) = \frac{5x^2 + 13x - 6}{x + 3}$

$f(x) = \frac{(5x-2)(x+3)}{x+3}$ $\frac{-30}{-215}$ $\frac{5}{5}$

Type: hole

Location: $(-3, -17)$

3. $f(x) = \frac{x^2 - x - 12}{x^2 + 2x - 15}$

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

Type: asymptote

Location: $x = -5$
 $x = 3$

4. $f(x) = \begin{cases} 2x - 3 & x < 5 \\ x^2 - 18 & x \geq 5 \end{cases}$

$f(5) = 10 - 3 = 7$ $f(5) = 5^2 - 18 = 7$

Type: None

Location: none

GRAPH:

5. $f(x) = \begin{cases} (x+2)^2 & x < -1 \\ -x+3 & x \geq -1 \end{cases}$

