Rational Functions (worksheet)

1. $f(x) = \frac{1}{(x+3)(x-2)}$; D: $x \in \mathbb{R}$; $x \neq -3, 2$
R: $y \in \mathbb{R}$; $y \neq 0$

Vertical Asymptotes: $x = -3$, $x = 2$ Horizontal Asymptotes: $y = 0$

2. $f(x) = \frac{-3}{x^2+6x+8} = \frac{-3}{(x+4)(x+2)}$; D: $x \in \mathbb{R}$; $x \neq -2, -4$
R: $y \in \mathbb{R}$; $y \neq 0$

Vertical: $x = -2$, $x = -4$ Horizontal: $y = 0$

3. $f(x) = \frac{2}{(2x+3)(2x-3)}$; D: $x \in \mathbb{R}$; $x \neq -\frac{3}{2}, \frac{3}{2}$
R: $y \in \mathbb{R}$; $y \neq 0$

Vertical: $x = -\frac{3}{2}$, $x = \frac{3}{2}$ Horizontal: $y = 0$

4. $y = \frac{-1}{(x+4)(x-1)} + 2$; D: $x \in \mathbb{R}$; $x \neq -4, 1$
R: $y \in \mathbb{R}$; $y \neq 2$

Vertical: $x = -4$, $x = 1$ Horizontal: $y = 2$

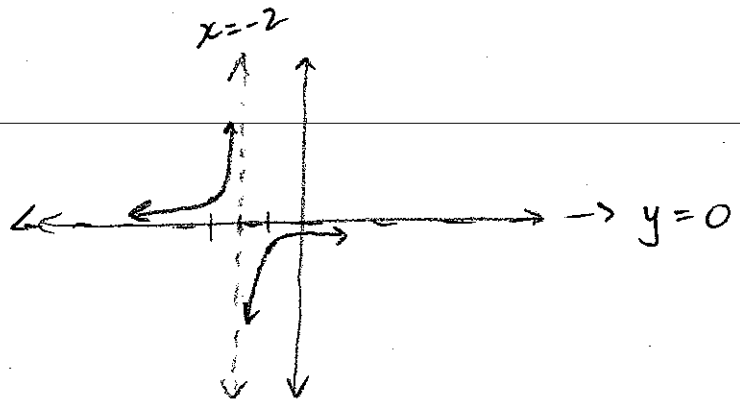
5. $y = \frac{1}{(x-3)(2x-1)} - 1$; D: $x \in \mathbb{R}$; $x \neq 3, \frac{1}{2}$
R: $y \in \mathbb{R}$; $y \neq -1$

Vertical: $x = 3$, $x = \frac{1}{2}$ Horizontal: $y = -1$

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

No x-ints!

y-int = $\boxed{(0, -\frac{1}{2})}$

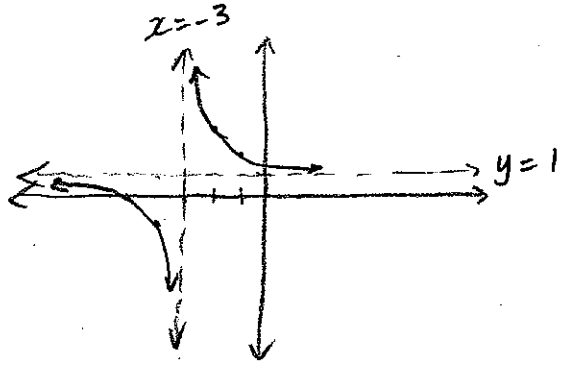


2. $f(x) = \frac{2}{x+3} + 1$

x-int: $0 = \frac{2}{x+3} + 1$

$\boxed{(-5, 0)}$

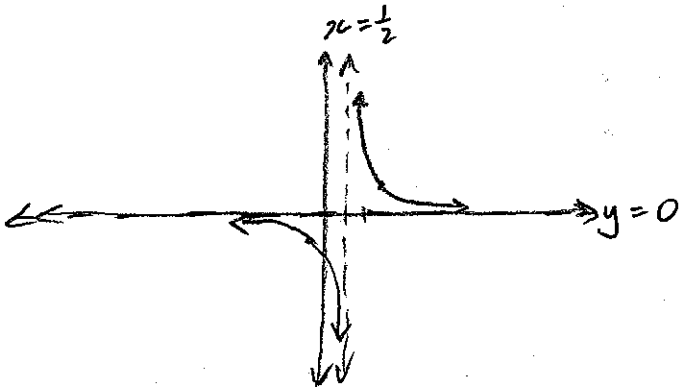
y-int: $\boxed{(0, \frac{5}{3})}$



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

No x-ints!

y-int = $\boxed{(0, -2)}$

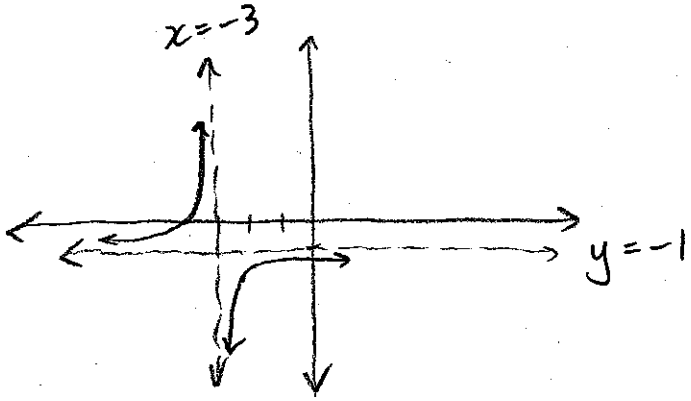


4. $f(x) = \frac{-1}{x+3} - 1$

x-int: $0 = \frac{-1}{x+3} - 1$

$\boxed{(-4, 0)}$

y-int: $\boxed{(0, -\frac{4}{3})}$



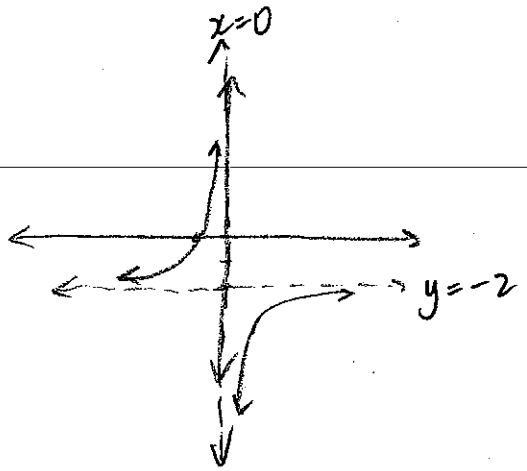
5. $y = \frac{2}{-x} - 2$

$y = \frac{-2}{x} - 2$

x-int: $0 = \frac{-2}{x} - 2$

$x = -1$ $\boxed{(-1, 0)}$

No y-int!

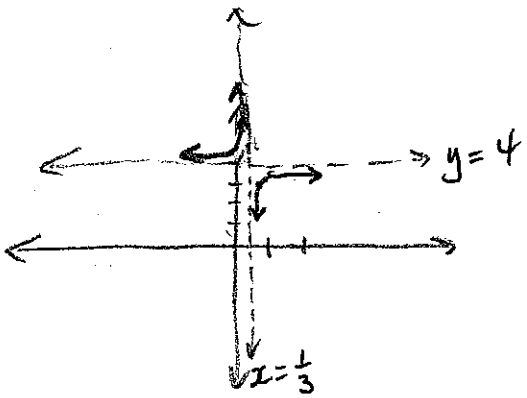


6. $f(x) = \frac{-1}{3x-1} + 4$

x-int: $0 = \frac{-1}{3x-1} + 4$

$\boxed{\left(\frac{5}{12}, 0\right)}$

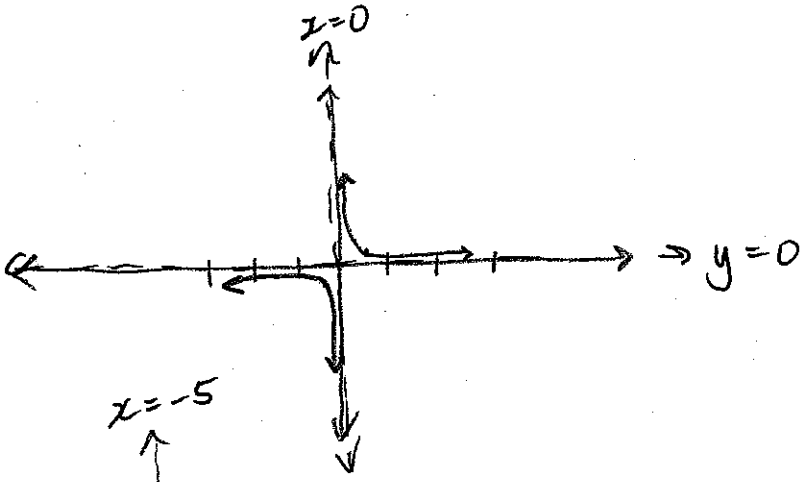
y-int: $\boxed{(0, 5)}$



7. $y = \frac{0.25}{2x}$

No x-ints!

No y-ints!



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

x-int: $0 = \frac{-3}{x+5} - 4$

$\boxed{\left(\frac{-23}{4}, 0\right)}$

y-int: $\boxed{\left(0, \frac{-23}{5}\right)}$