

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

y-intercept: $(0, -2/3)$

x-intercept: $(, 0)$

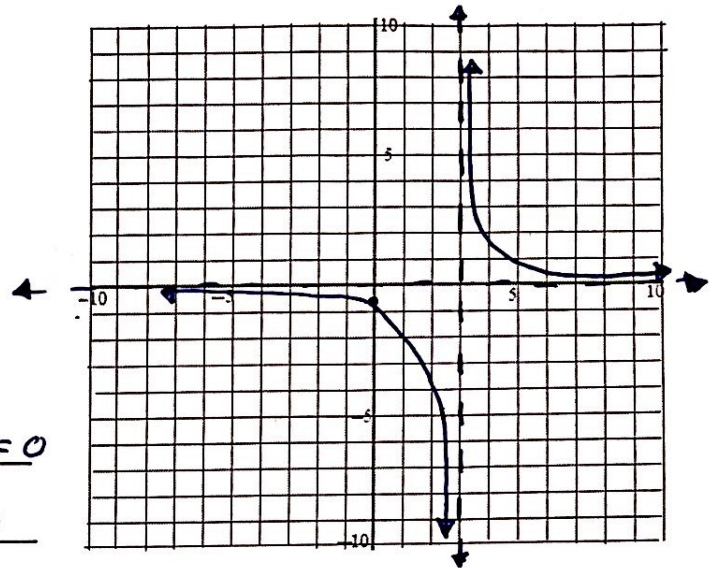
Vertical Asymptotes: $x=3$ Horizontal Asymptotes: $y=0$

Domain: $(-\infty, 3) \cup (3, \infty)$ Range: $(-\infty, 0) \cup (0, \infty)$

End-Behavior:

as $x \rightarrow \infty, f(x) \rightarrow$ 0

as $x \rightarrow -\infty, f(x) \rightarrow$ 0



2.) $y = \frac{-1}{x+2} + 4$

$0 = \frac{-1}{x+2} + 4$

$-4 = \frac{-1}{x+2}$

$-4x - 8 = -1$

$-4x = 7$

$x = -7/4$

y-intercept: $(0, 3.5)$

x-intercept: $(-7/4, 0)$

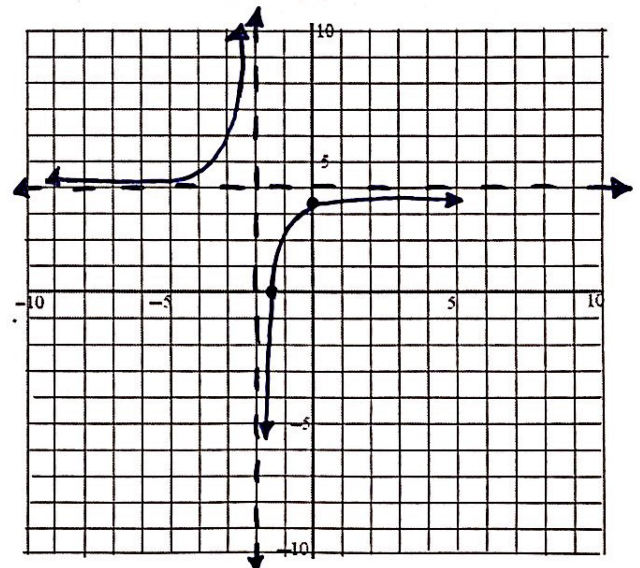
Vertical Asymptotes: $x=-2$ Horizontal Asymptotes: $y=4$

Domain: $(-\infty, \infty)$ Range: $(-\infty, 4)$

End-Behavior:

as $x \rightarrow \infty, f(x) \rightarrow$ 4

as $x \rightarrow -\infty, f(x) \rightarrow$ 4



Simplify the following completely and state the restrictions.

$$\frac{10}{-5} \cdot \frac{-2}{-7}$$

3.) $\frac{2n-1}{n+5} + \frac{4n}{2n+10}$

$$\frac{2(2n-1)}{2(n+5)} + \frac{4n}{2(n+5)}$$

$$\frac{4n-2}{2(n+5)} + \frac{4n}{2(n+5)}$$

$$\frac{8n-2}{2(n+5)}$$

$$\frac{2(4n-1)}{2(n+5)}$$

$$\frac{4n-1}{n+5}$$

4.) $\frac{2x+3}{2x^2-7x+5} - \frac{x+2}{x-1}$

$$\frac{2x+3}{(2x-5)(x-1)} - \frac{x+2}{(x-1)} \cdot \frac{(2x-5)}{(2x-5)}$$

$$\frac{2x+3}{(2x-5)(x-1)} - \frac{(2x^2-x-10)}{(x-1)(2x-5)}$$

$$\frac{-2x^2+3x+13}{(2x-5)(x-1)}$$

5.) $\frac{2x}{x^2+8x+15} - \frac{x-3}{x+5}$

$$\frac{2x}{(x+5)(x+3)} - \frac{x-3}{x+5} \cdot \frac{(x+3)}{(x+3)}$$

$$\frac{2x}{(x+5)(x+3)} - \frac{(x^2-9)}{(x+5)(x+3)}$$

$$\frac{-x^2+2x+9}{(x+5)(x+3)}$$

6.) $\frac{3x+2}{x^2-2x-3} + \frac{x+1}{x-3}$

$$\frac{3x+2}{(x-3)(x+1)} + \frac{x+1}{(x-3)}$$

$$\frac{3x+2}{(x-3)(x+1)} + \frac{x+1}{(x-3)} \cdot \frac{(x+1)}{(x+1)}$$

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

$$\frac{x^2+5x+3}{(x-3)(x+1)}$$

Simplify the following completely. State the restrictions.

7.) $\frac{4x^2-9}{2x-10} \cdot \frac{x^3-10x^2+25x}{2x^2-7x+6} \div \frac{x^3-4x^2-5x}{6x^3+6x^2-24x-24}$

$$\frac{12}{-4} \cdot \frac{-3}{-7}$$

$$\frac{(2x-3)(2x+3)}{2(x-5)} \cdot \frac{x(x-5)(x-5)}{(2x-3)(x-2)} \cdot \frac{6(x+1)(x+2)(x-2)}{6(x-5)(x+1)}$$

$$3(2x+3)(x+2)$$

$$(6x^3+6x^2) + (-24x-24)$$

$$6x^2(x+1) - 24(x+1)$$

$$(x+1)(6x^2-24)$$

$$6(x+1)(x^2-4)$$

Simplify the following completely. State the restrictions.

$$8.) \frac{\frac{x^2+8x+15}{x^2+x-6}}{\frac{x^2+2x-15}{x^2-4}} \div \frac{x^2+2x-15}{x^2-4}$$

$$\frac{\cancel{(x+5)}(x+3)}{\cancel{(x+3)}(x-2)} = \frac{(x+2)\cancel{(x-2)}}{\cancel{(x+5)}(x-3)}$$

$$\frac{(x+2)}{(x-3)}$$

Find all the solutions and state any extraneous solutions of the following rational equations.

$$9.) \left[\frac{x}{x-2} + \frac{1}{x-4} = \frac{2}{x^2-6x+8} \right] (x-4)(x-2)$$

$$x(x-4) + (x-2) = 2$$

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

$$x^2 - 3x - 4 = 0$$

$$(x-4)(x+1) = 0$$

$$x = 4 \quad \boxed{x = -1}$$

EXTRANEOUS

$$10.) \left[\frac{2x}{x-1} + \frac{1}{x-3} = \frac{2}{x^2-4x+3} \right] (x-3)(x-1)$$

$$2x(x-3) + x-1 = 2$$

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

$$2x^2 - 5x - 3 = 0$$

$$(2x+1)(x-3) = 0$$

$$\boxed{x = -1/2} \quad x = 3$$

EXTRANEOUS

$$\begin{array}{r} -6 \\ \frac{-6}{2} \times \frac{1}{2} \\ -5 \end{array}$$