

1. Find the following for $f(x) = \frac{5}{x-2}$

and graph the function.

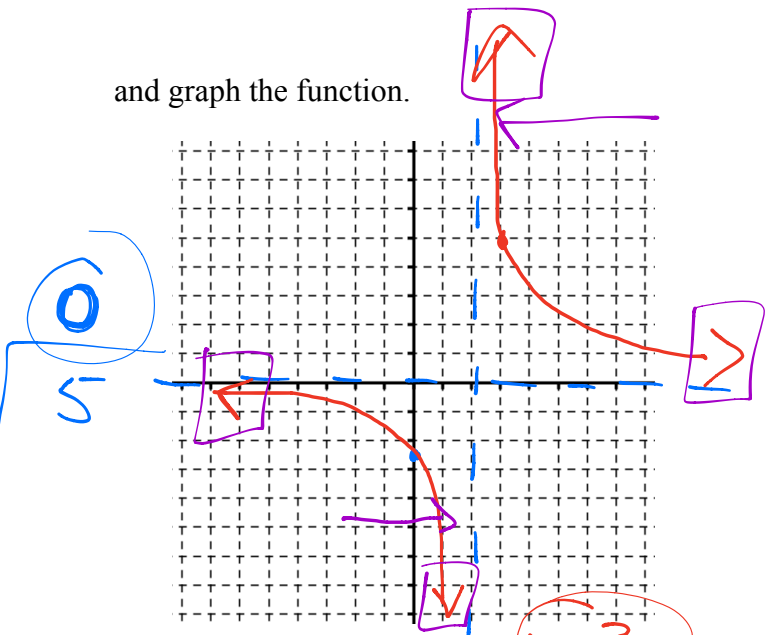
- a. Domain $\{x | x \neq 2\}$
- b. Vertical Asymptote(s) $x = 2$
- c. x-intercept(s) NONE
- d. y-intercept $(0, -\frac{5}{2})$
- e. End Behavior Asymptote $y = 0$
- f. Analyze the end behavior using limit notation

$\lim_{x \rightarrow -\infty} f(x) = 0$ $\lim_{x \rightarrow \infty} f(x) = 0$

- g. Analyze the behavior near each vertical asymptote using limit notation.

$\lim_{x \rightarrow 2^-} f(x) = -\infty$ $\lim_{x \rightarrow 2^+} f(x) = \infty$

from the left



$\lim_{x \rightarrow 3^-} f(x) = -\infty$ $\lim_{x \rightarrow 3^+} f(x) = \infty$ $\lim_{x \rightarrow -\infty} f(x) = 0$ $\lim_{x \rightarrow \infty} f(x) = 0$

$(3, 5)$ $\frac{3-2}{1} = \frac{1}{1} = 1$

2. Find the following for $f(x) = \frac{x-1}{x^2-2x-3}$

and graph the function.

- a. Domain $\{x | x \neq 3, -1\}$
- b. Vertical Asymptote(s) $x = 3, -1$
- c. x-intercept(s) $(1, 0)$
- d. y-intercept $(0, \frac{1}{3})$
- e. End Behavior Asymptote $y = 0$
- f. Analyze the end behavior using limit notation

$\lim_{x \rightarrow -\infty} f(x) = 0$ $\lim_{x \rightarrow \infty} f(x) = 0$

- g. Analyze the behavior near each vertical asymptote using limit notation.

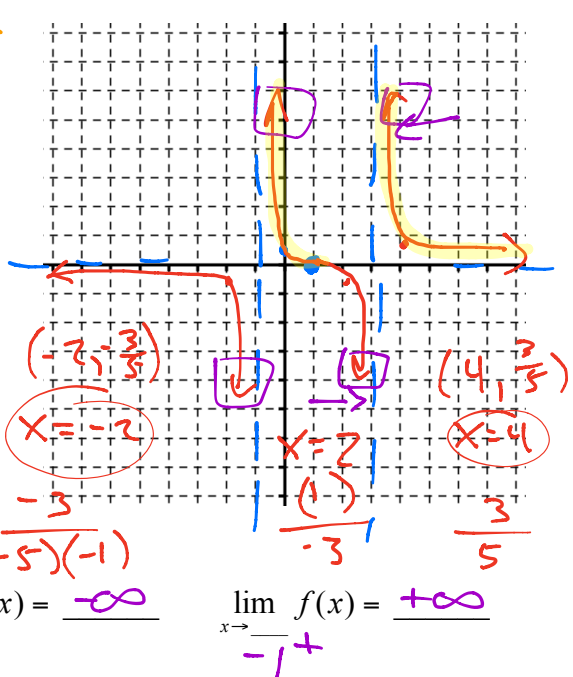
$\lim_{x \rightarrow 3^-} f(x) = -\infty$ $\lim_{x \rightarrow 3^+} f(x) = \infty$ $\lim_{x \rightarrow -1^-} f(x) = -\infty$ $\lim_{x \rightarrow -1^+} f(x) = +\infty$

Solve: $\frac{x-1}{x^2-2x-3} > 0$

$x-1 = 0 \Rightarrow x = 1$

$x^2-2x-3 = 0 \Rightarrow (x-3)(x+1) = 0 \Rightarrow x = 3, -1$

$(-1, 1) \cup (3, \infty)$



$(-\infty, -\frac{3}{5})$ $(4, \frac{3}{5})$

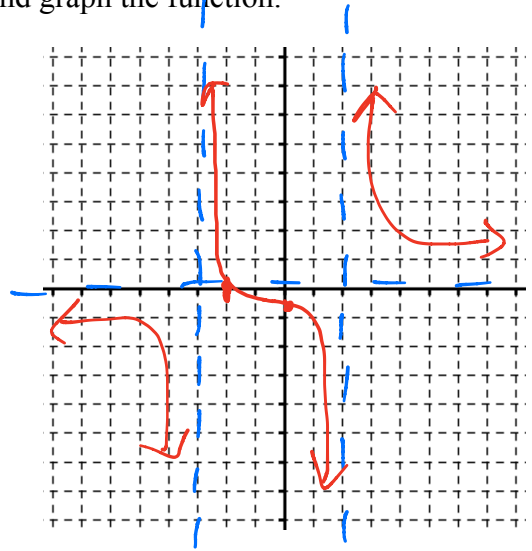
$x = -2$ $x = 2$ $x = 4$

$\frac{-3}{5} = -\frac{3}{5}$ $\frac{3}{5} = \frac{3}{5}$

3. Find the following for $f(x) = \frac{x+2}{x^2+x-6} = \frac{x+2}{(x+3)(x-2)}$

and graph the function.

- a. Domain $\{x | x \neq -3, 2\}$
- b. Vertical Asymptote(s) $x = -3, 2$
- c. x-intercept(s) $(-2, 0)$
- d. y-intercept $(0, -\frac{1}{3})$
- e. End Behavior Asymptote $y = 0$
- f. Analyze the end behavior using limit notation



$\lim_{x \rightarrow -\infty} f(x) = 0$ $\lim_{x \rightarrow \infty} f(x) = 0$

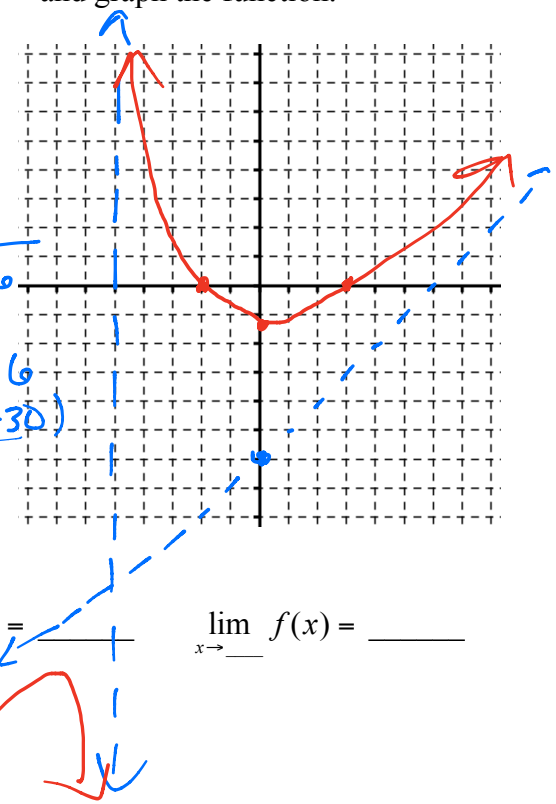
g. Analyze the behavior near each vertical asymptote using limit notation.

$\lim_{x \rightarrow -3^-} f(x) = -\infty$ $\lim_{x \rightarrow -3^+} f(x) = \infty$ $\lim_{x \rightarrow 2^-} f(x) = -\infty$ $\lim_{x \rightarrow 2^+} f(x) = \infty$

4. Find the following for $f(x) = \frac{x^2-x-6}{x+5}$

and graph the function.

- a. Domain $\{x | x \neq -5\}$
- b. Vertical Asymptote(s) $x = -5$
- c. x-intercept(s) $(3, 0), (-2, 0)$
- d. y-intercept $(0, -\frac{6}{5})$
- e. End Behavior Asymptote $y = x - 6$
- f. Analyze the end behavior using limit notation



$\lim_{x \rightarrow -\infty} f(x) = -\infty$ $\lim_{x \rightarrow \infty} f(x) = \infty$

g. Analyze the behavior near each vertical asymptote using limit notation.

$\lim_{x \rightarrow -5^-} f(x) = -\infty$ $\lim_{x \rightarrow -5^+} f(x) = \infty$ $\lim_{x \rightarrow \infty} f(x) =$ $\lim_{x \rightarrow -\infty} f(x) =$

5. Find the following for $f(x) =$

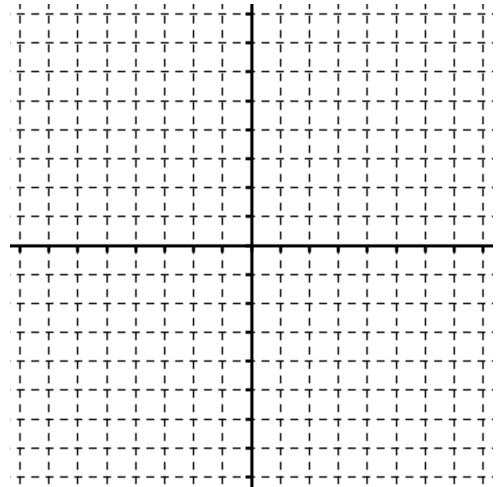
and graph the function.

- a. Domain _____
- b. Vertical Asymptote(s) _____
- c. x -intercept(s) _____
- d. y -intercept _____
- c. End Behavior Asymptote _____
- f. Analyze the end behavior using limit notation

$$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}}$$

- g. Analyze the behavior near each vertical asymptote using limit notation.

$$\lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}}$$



6. Find the following for $f(x) =$

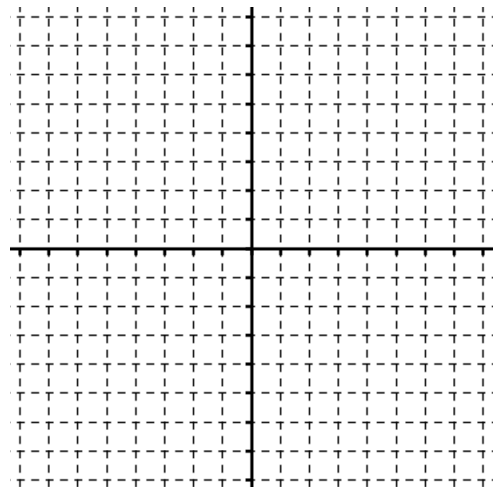
and graph the function.

- a. Domain _____
- b. Vertical Asymptote(s) _____
- c. x -intercept(s) _____
- d. y -intercept _____
- c. End Behavior Asymptote _____
- f. Analyze the end behavior using limit notation

$$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}}$$

- g. Analyze the behavior near each vertical asymptote using limit notation.

$$\lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}}$$



7. Find the following for $f(x) =$

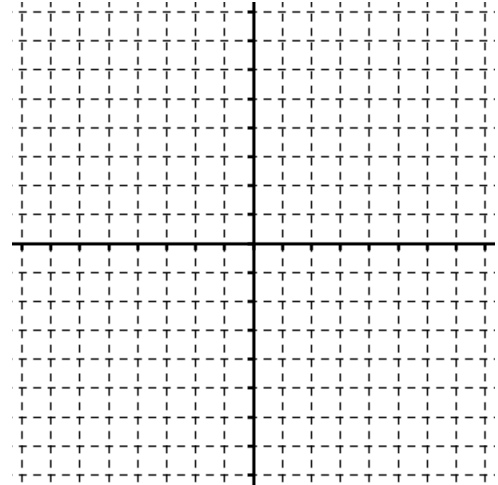
and graph the function.

- a. Domain _____
- b. Vertical Asymptote(s) _____
- c. x -intercept(s) _____
- d. y -intercept _____
- c. End Behavior Asymptote _____
- f. Analyze the end behavior using limit notation

$$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}}$$

- g. Analyze the behavior near each vertical asymptote using limit notation.

$$\lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}}$$



8. Find the following for $f(x) =$

and graph the function.

- a. Domain _____
- b. Vertical Asymptote(s) _____
- c. x -intercept(s) _____
- d. y -intercept _____
- c. End Behavior Asymptote _____
- f. Analyze the end behavior using limit notation

$$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}}$$

- g. Analyze the behavior near each vertical asymptote using limit notation.

$$\lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow \underline{\hspace{1cm}}} f(x) = \underline{\hspace{2cm}}$$

