

$(-3, \frac{16}{5})$

1.

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

Asymptote(s): VA $x = -2, 2$
 HA $y = 1$

Intercepts:
 $(0, \frac{5}{4})$
 $(5, 0) (-1, 0)$

Graph:

2.

$$y = \frac{(x-3) \cdot x}{(x+1)(x-4)}$$

Asymptote(s): VA $x = -1, 4$
 HA $y = 1$

Intercepts:
 $(0, 0) (3, 0)$
 $(5, 1\frac{2}{3}) (-2, 1\frac{2}{3})$

Graph:

$$\frac{-1 \cdot 2}{3 \cdot -2} = \frac{-2}{-6} = \frac{1}{3}$$

$$\frac{2 \cdot 5}{6 \cdot 1} = \frac{10}{6} = 1\frac{2}{3} \quad \frac{-5 \cdot -2}{-1 \cdot -6} = \frac{10}{6}$$

~~Has slant asymptote~~

~~$y = \frac{x^2 - 6x + 2}{(x - 2)}$~~

~~Asymptote(s):~~

~~Intercepts:~~

Graph:

4.

$y = \frac{4(x-3)(x-5)(x+1)}{(x+1)(x-3)(x+1)}$

$\frac{4(x-3) + (x-5)(x+1)}{(x+1)(x-3)}$

Asymptote(s):
 HA $x = -1, 3$
 VA $y = 1$

Intercepts:
 $(\sqrt{17}, 0)$ $(-\sqrt{17}, 0)$
 $(0, \frac{17}{3})$

$\frac{x^2 - 17}{(x+1)(x-3)}$

Graph:

$4x - 12 + x^2 - 4x - 5$
 $x^2 - 17$

$(1, 4)$ $(2, \frac{13}{3})$

$\frac{1^2 - 17}{2 \cdot \sqrt{2}} = \frac{-16}{-4} = 4$ $\frac{4 - 17}{3 - 1} = \frac{-13}{2} = -6.5$

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

$$(1, -3/4) \quad (2, -2)$$

$$\frac{3}{2 \cdot 2} = \frac{3}{4}$$

$$\frac{6}{3 \cdot -1} = -2$$

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

5.

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

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

Asymptote(s):

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

VA: $x = -1, 3$

HA: $y = 0$

Intercepts:

$(0, 0)$

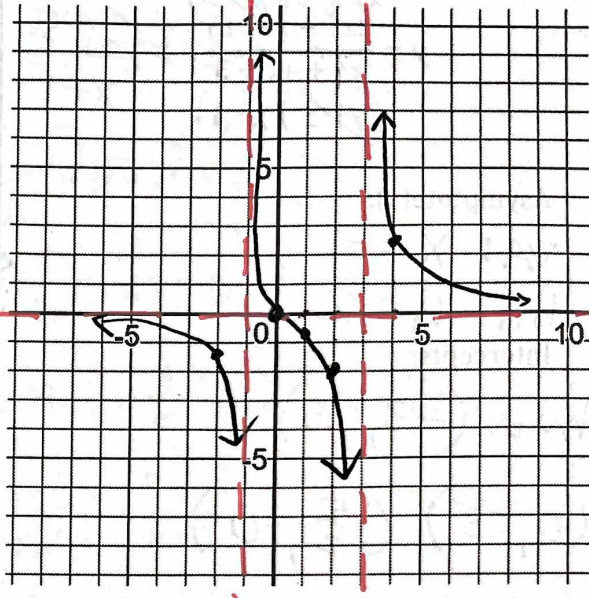
$(4, 2\frac{3}{5})$

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

$$\frac{12}{5 \cdot 1} = \frac{12}{5} = 2\frac{3}{5}$$

$$\frac{-6}{-1 \cdot -5} = \frac{-6}{5} = -1\frac{1}{5}$$

Graph:



6.

$$y = \frac{(x+5)(x-1) + 2(x+4)}{(x+4)(x-1)}$$

Asymptote(s):

$$\frac{-2x - 13}{(x+4)(x-1)}$$

VA: $x = -4, 1$

HA: $y = 0$

Intercepts:

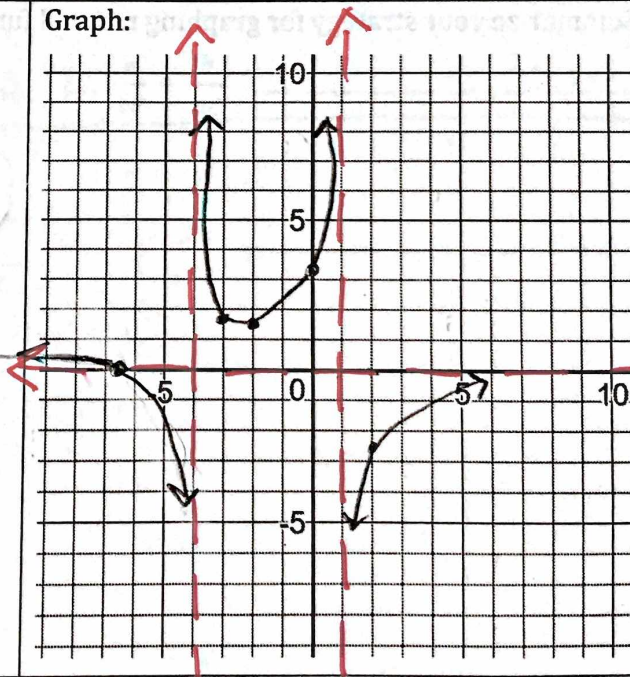
$(-1\frac{1}{2}, 0)$ $(0, \frac{13}{4})$

$-6\frac{1}{2}$

$3\frac{1}{4}$

$(2, -2\frac{5}{6})$

Graph:



$(-2, \frac{3}{2})$

$$\frac{-9}{2 \cdot 3}$$

$$\frac{-9}{-6}$$

$$\frac{3}{1}$$

$(-3, 1\frac{3}{4})$

$$\frac{-7}{1 \cdot -4}$$

$$+1\frac{3}{4}$$

$$\frac{-17}{6 \cdot 1} = \frac{-17}{6} = -2\frac{5}{6}$$

$$\frac{x^2 + 4x - 5 - (x^2 + 6x + 8)}{(x+4)(x-1)} = \frac{x^2 + 4x - 5 - x^2 - 6x - 8}{(x+4)(x-1)} = \frac{-2x - 13}{(x+4)(x-1)}$$

7.

$$y = \frac{(2x-5)(x+3)}{x^2 + x - 15} = \frac{2x-5}{x+1}$$

~~(x+3)(x+1)~~

Asymptote(s):

VA: $x = -1$

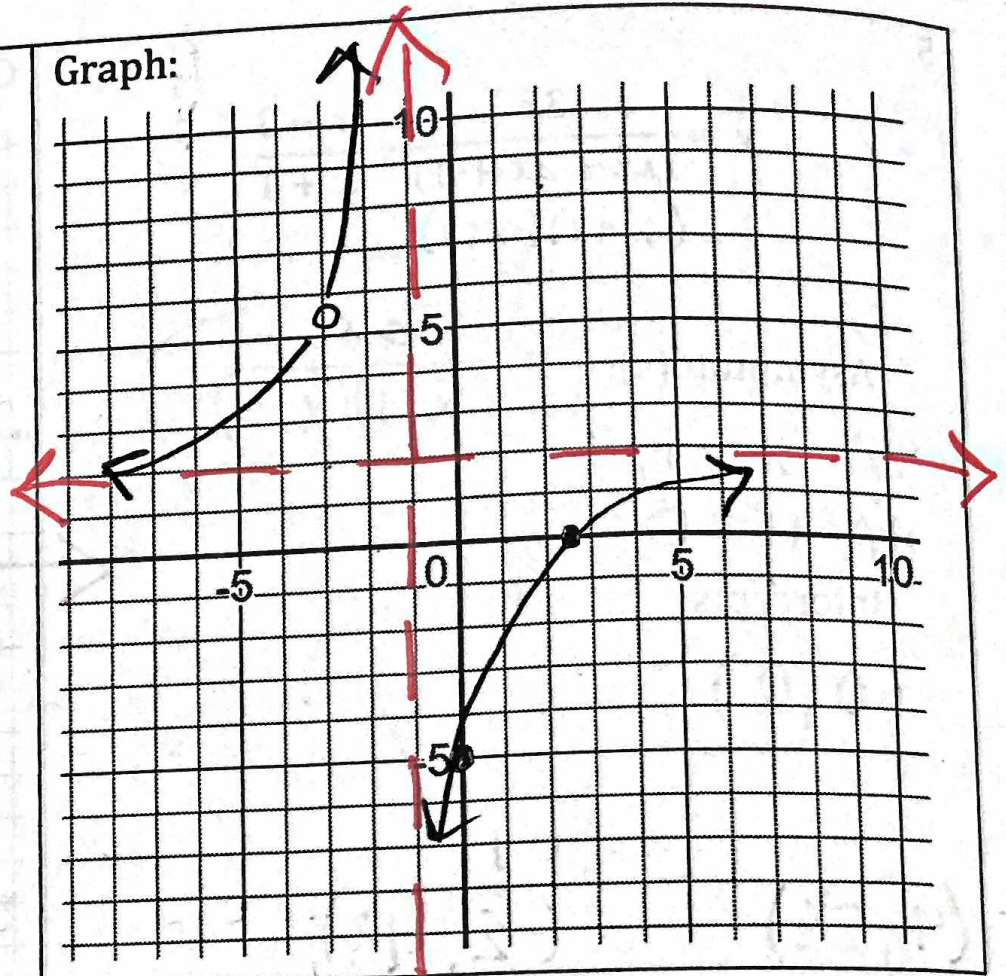
HA: $y = 2$

Intercepts:

hole $(-3, 5.5)$

$(0, -5)$ $(\frac{5}{2}, 0)$

Graph:



8. Summarize your strategy for graphing rational functions with a step-by-step process.