

Graphing Rational Functions

$$y = \frac{x-3}{x+5}$$

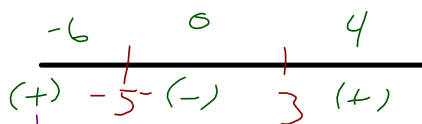
1) Vertical Asymptote(s)

where denom = 0

$$x+5=0 \rightarrow x=-5$$

2) Zeros of function where numer = 0 $x-3=0$ $x=3$

3) Sign Analysis: Made up of undefined and zero.



4) Horizontal Asymptote(s)

$$y=1 \text{ or } y=1$$

Case 1

Greatest power of x is in num.

no horizontal Asym.

Case 2

> power of x is in denominator.

$y=0$ is hor. Asym.

Case 3

> power in both

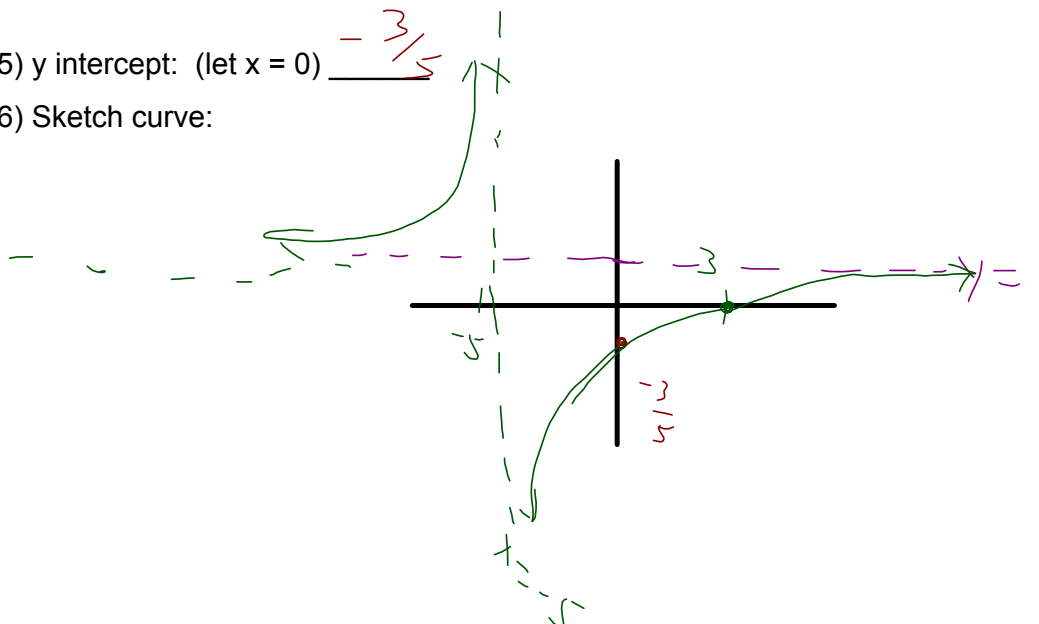
$$y = \frac{\text{leading coef}}{\text{leading coef}}$$

Reminder: Graph can never cross a vertical Asymptote must approach it toward $\pm\infty$

5) y intercept: (let $x=0$)

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

6) Sketch curve:

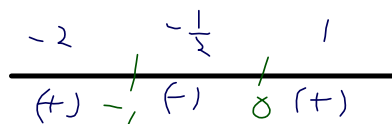


$$y = \frac{x+1}{x}$$

1) Vertical Asymptote(s) $x=0$

2) Zeros of function $x+1=0$ $x=-1$

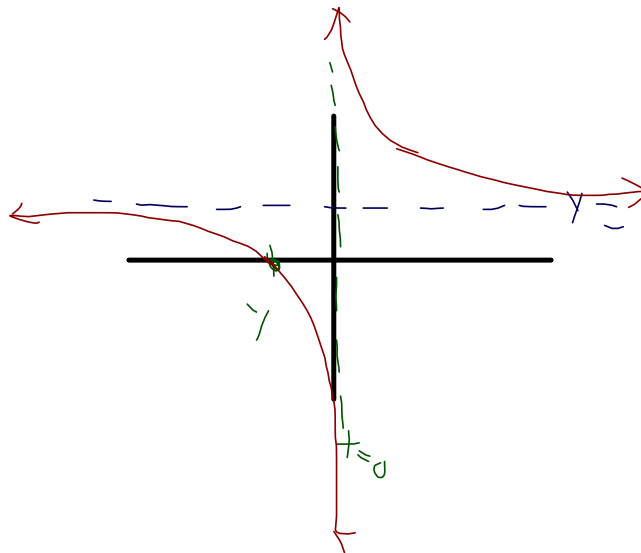
3) Sign Analysis :



4) Horizontal Asymptote(s) $y=1$

5) y intercept: (let $x = 0$) $\emptyset$

6) Sketch curve:



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

1) Vertical Asymptote(s) $x=0$ $x=-3$

2) Zeros of function $x=2$

3) Sign Analysis : $y=0$

4) Horizontal Asymptote(s) $y=0$

5) y intercept: (let $x=0$) $\emptyset$

6) Sketch curve:

