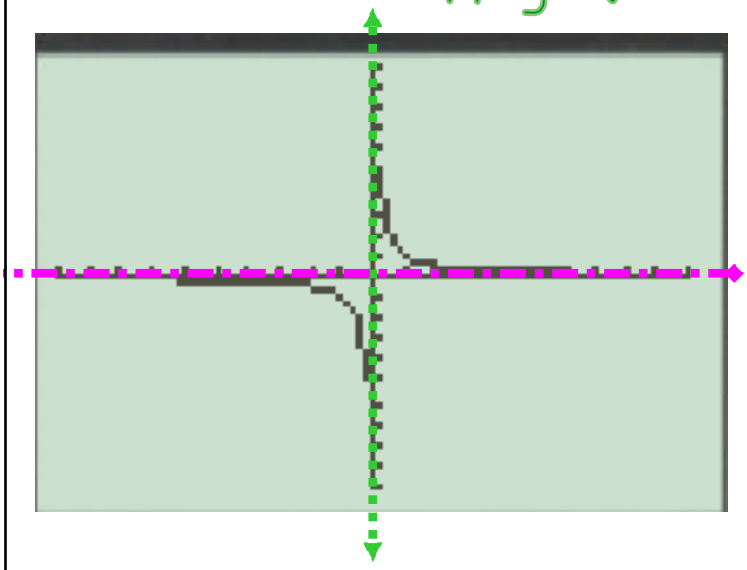
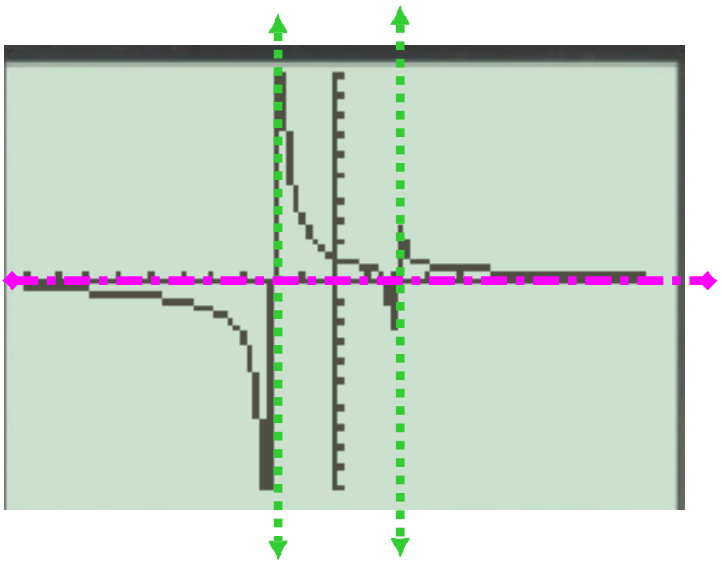
graph $f(x) = \frac{1}{x}$

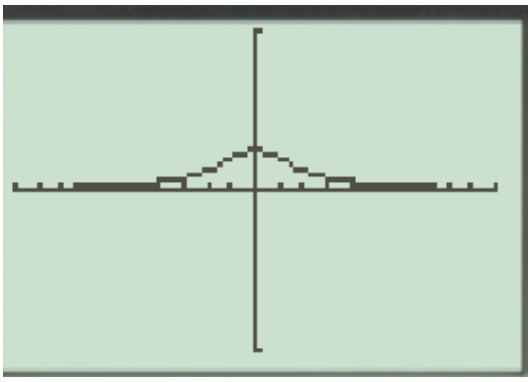
Vertical Asymptote



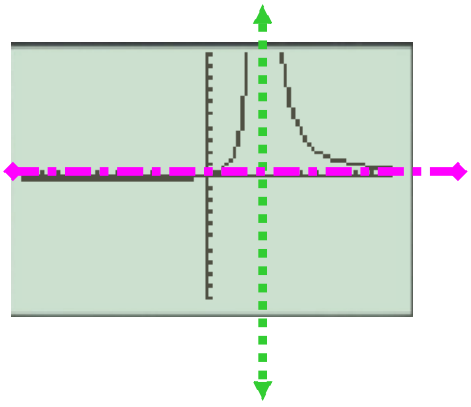
2) $f(x) = \frac{3x-5}{x^2-4}$



3) $f(x) = \frac{1}{x^2+4}$



4) $f(x) = \frac{3x}{x^2-6x+9}$



5) $f(x) = \dfrac{x+2}{x^2+2x} = \dfrac{(x+2)}{x(x+2)} = \dfrac{1}{x}$

$x^2 + 2x \neq 0$

$x(x+2) \neq 0$

$x \neq 0 \quad x+2 \neq 0$

$x \neq -2$

Vertical Asymptote $\Rightarrow x = 0$

Inconsistency $\Rightarrow x = -2$

Vertical Asymptotes

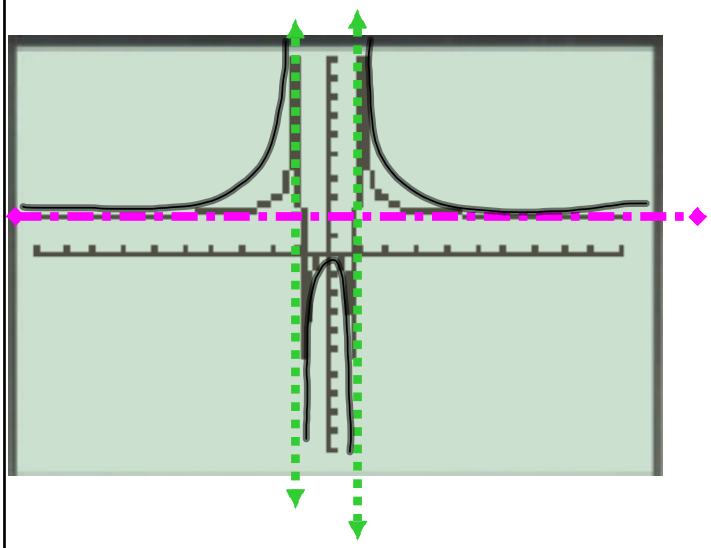
1) Find Domain Restrictions

$D(x) \neq 0$

2) Look for common terms on Top and Bottom. If any cancel out those are your "holes" in the graph

3) All Left over Domain Restrictions are Vertical Asymptotes

Graph $f(x) = \frac{2x^2}{x^2 - 1}$



Horizontal Asymptote

1) Find the degree of $N(x)$ and $D(x)$

2) "n" degree of $N(x)$ "d" degree of $D(x)$

a) $n > d$ (no horz. Asymptote)

b) $n < d$ (horz. Asy. $\rightarrow y = 0$)

c) $n = d$ (horz. Asy. $\rightarrow y = \frac{\text{L.C. of } N(x)}{\text{L.C. of } D(x)}$)

$$f(x) = \frac{x^2+x-2}{x^2-x-6} = \frac{(x-1)(x+2)}{(x-3)(x+2)}$$

1) Domain = $x \neq -2, 3$

2) Vertical Asymptotes $\Rightarrow$ $x = 3$

3) Horizontal Asymptote $\rightarrow$ $y = 1$

$$f(x) = \frac{3x^3+7x^2+2}{-4x^3+5}$$

1) Domain $\rightarrow$ $x \neq \sqrt[3]{5/4}$

$-4x^3+5 \neq 0$

$-4x^3 \neq -5$

$\sqrt[3]{x^3} = \sqrt[3]{5/4}$

$x = \sqrt[3]{5/4}$

2) Vertical Asymptote $\rightarrow$ $x = \sqrt[3]{5/4}$

3) Horz. Asy. $\rightarrow$ $y = -\frac{3}{4}$