

GUIDED NOTES: Graphs of Rational Functions

For each Rational Function, determine:

- 1) vertical asymptotes (factors that DO NOT cancel)
- 2) holes (factors that DO cancel)
- 3) domain (what values of x are excluded)
- 4) horizontal asymptotes (compare degrees of the numerator and denominator)
- 5) graph!

EX1: $h(x) = \frac{1}{x-1}$

$$\frac{x-1=0}{x-1} \Rightarrow x=1$$

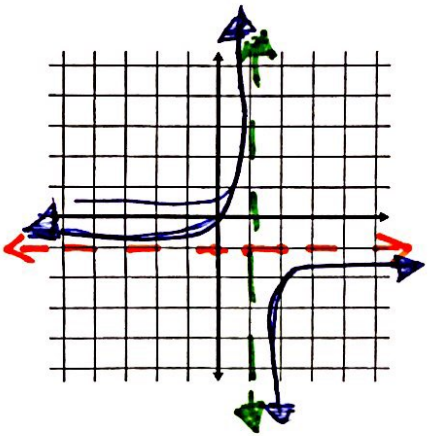
V.A.: $x=1$

Holes: None.

Domain: All real #'s $x \neq 1$

H.A.: $y=1$

$$\frac{\text{Deg } 1}{\text{Deg } 1}$$



EX2: $f(x) = \frac{6}{(x-3)(x+4)}$

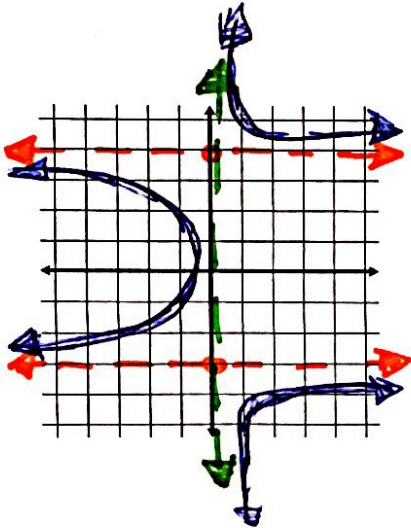
V.A.: $x=3, -4$

Holes: None

Domain: All real #'s $x \neq 3, -4$

H.A.: $y=0$

$$\frac{\text{Deg } 0}{\text{Deg } 2}$$



EX3: $f(x) = \frac{1-x^2+x-2}{1-x^2+5x+6}$

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

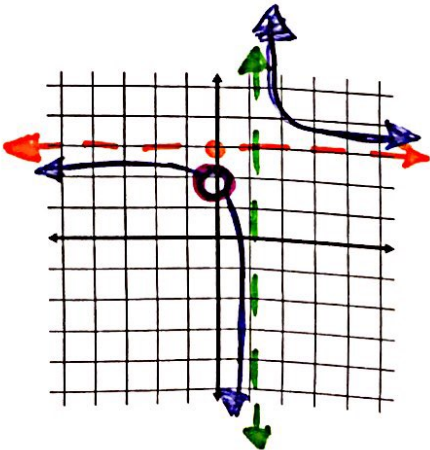
V.A.: $x=-3$

Hole: $x=-2$

Domain: All real #'s $x \neq -2, -3$

H.A.: $y=1$

$$\frac{\text{Deg } 2}{\text{Deg } 2}$$



EX4: $f(x) = \frac{x^2-4}{x^2-2} = \frac{(x+2)(x-2)}{x-2}$

V.A.: None

Holes: $x=2$

Domain: All real #'s $x \neq 2$

H.A.: None

$$\frac{\text{Deg } 2}{\text{Deg } 1}$$

