

① FIND VA OR HOLES

② FIND DOMAIN

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

$$(2) f(x) = \frac{x}{x^2+5x-36}$$

$$(3) f(x) = \frac{x-4}{x^3-16x}$$

$$(4) f(x) = \frac{x+5}{x^2-25}$$

$$(5) f(x) = \frac{4-2x}{3x-1}$$

3.7 NOTES - HORIZONTAL ASYMPTOTES

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

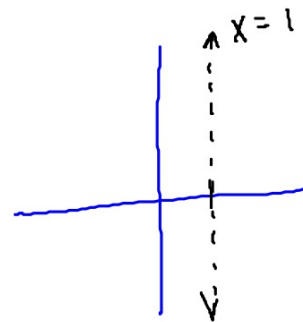
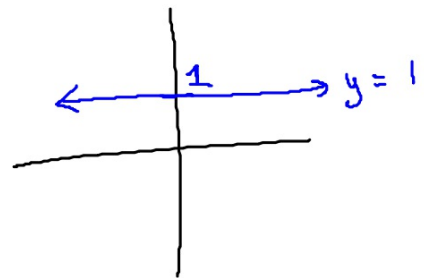
Linear → HA
 $y=0$ → *Quadratic*

* If the denominator grows faster the HA is $y=0$

$$\frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{4} \quad \frac{1}{5} \quad \frac{1}{6}$$

END BEHAVIOR

$$\begin{aligned} x \rightarrow -\infty & \quad y \rightarrow 0 \\ x \rightarrow \infty & \quad y \rightarrow 0 \end{aligned}$$



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

NO HORIZONTAL ASYMPTOTE

* If the numerator is growing faster there is no HA

$$f(x) = \frac{2x^3 + 5x^2 - 7x + 1}{7x^3 + 3x - 2}$$

$$\text{HA: } y = \frac{2}{7}$$

End Behavior
 $x \rightarrow -\infty \quad y \rightarrow \frac{2}{7}$
 $x \rightarrow \infty \quad y = \frac{2}{7}$

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

End Behavior Model $y = \frac{1x^2}{4x^2} = \frac{1}{4}$ HA

* If the numerator and denominator are growing the same (have the same degree)

the HA is found by dividing the leading coefficients