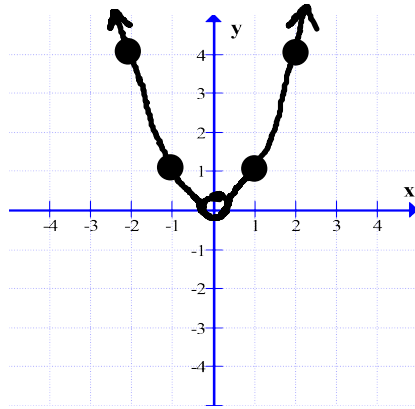


# C12 - 9.1 - Horizontal Asymptotes Cases Notes

$y = \frac{ax^m}{bx^n}$	$m > n$	HA: none	
	$m < n$	HA: $y = 0$	or HA: $y = c$
	$m = n$	HA: $y = \frac{a}{b}$	or HA: $y = \frac{a}{b} + c$

Case 1:

$$y = \frac{x^3}{x^1}$$

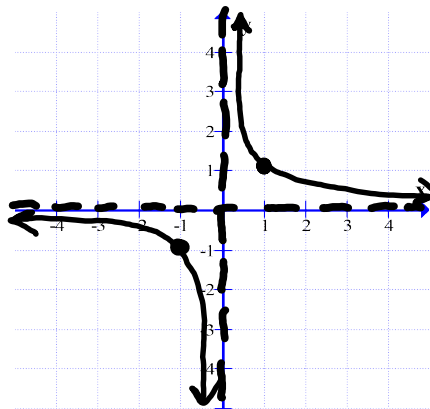


If the exponent of  $x$  is higher on the top than the bottom

HA: none

Case 2:

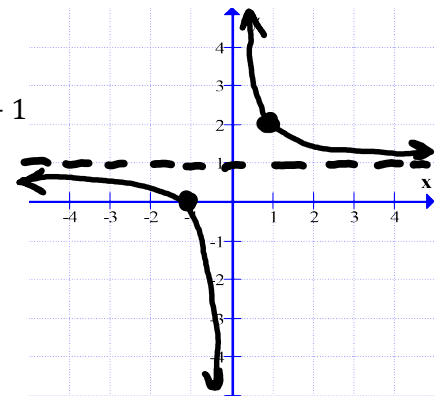
$$y = \frac{x^1}{x^2}$$



If the exponent of  $x$  is higher on the bottom

HA:  $y = 0$

$$y = \frac{x^1}{x^2} + 1$$



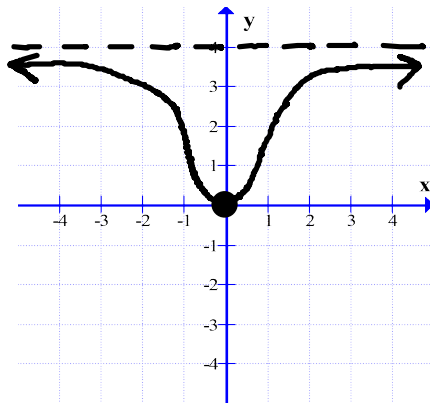
If case 2 is shifted up or down =  $c$

HA:  $y = c$       $y = 1$

$\frac{x^1}{x^2} + 1 = \frac{1x^1 + 1x^2}{1x^2}$ <p>LCD</p>
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Case 3:

$$y = \frac{4x^2}{1x^2 + 2}$$

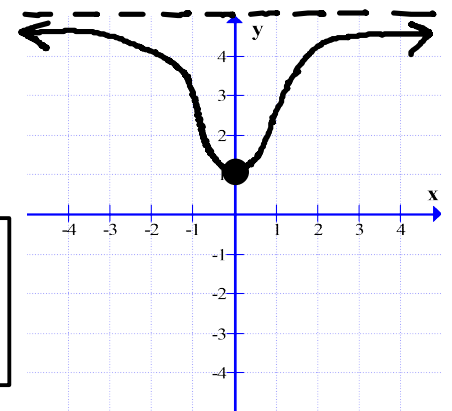


If the exponent of  $x$  is the same on the top as the bottom

HA:  $y = \text{fraction of coefficients}$

$$HA: y = \frac{4}{1}$$

$$y = \frac{4x^2}{1x^2 + 1} + 1$$



If case 3 is shifted up or down =  $c$

HA:  $y = \text{fraction of coefficients} + c$

$$HA: y = \frac{4}{1} + 1 = 5$$

$\frac{4x^2}{1x^2 + 1} + 1 = \frac{5x^2 + 1}{1x^2 + 1}$ <p>LCD</p>
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