

November 1

Horizontal Asymptotes of Rational Functions

Determine the horizontal asymptote:

$$\text{Ex 1 } f(x) = \frac{3x^3 - 6x + 2}{9x^2 - 4x}$$

step 1: Determine highest exponent in whole fraction. x^2
step 2: Find the term or terms that have that exponent.
step 3: Divide those terms. Variables should cancel.

$$y = \frac{3x^2}{9x^2}$$

$$\boxed{\text{HA: } y = \frac{1}{3}}$$

$$\text{Ex 2 } f(x) = \frac{7}{x - 3} \quad \text{highest: } x$$

$$y = \frac{0x}{1x} \leftarrow \text{because there aren't any on top}$$

$$\boxed{\text{HA: } y = 0}$$

$$\text{Ex 3 } f(x) = \frac{8x^4 + 2x^2 - 3x}{4x^2} \quad \text{highest: } x^4$$

$$y = \frac{8x^4}{0x^4} \leftarrow \text{because there aren't any in the bottom}$$

$\boxed{\text{does not exist}} \quad \text{DNE}$