

Horizontal Asymptote Rules

#1 If the degrees of the numerator & the denominator match, then the H.A is at $y =$ the coefficients

#2 If the numerator degree is $>$ the denominator, then the H.A is at $y = 0$

#3 If the numerator degree is $<$ the denominator, then there is no H.A!

Example 1 $\frac{3x^2 - 2x + 1}{4x^2 - 5}$

$N = D, y = \text{coefficients}$

$N > D, y = 0$

$N < D, \text{none!}$

H.A: $y = \frac{3}{4}$

Example 2

$$\frac{5x^7 - 11}{3x^3 + x^2 + 5x - 2}$$

$N = D, y = \text{coefficients}$

$N > D, y = 0$

$N < D, \text{none!}$

H.A: None

Example 3

$$\frac{4x^3 + 2x - 5}{12x^3 - 3x^2 - 3x + 10}$$

$N = D, y = \text{coefficients}$

$N > D, y = 0$

$N < D, \text{none!}$

$$\text{H.A.: } y = \frac{4}{12} = \frac{1}{3}$$

Example 4 $\frac{4x^2 + 9x - 1}{x + 5}$

$N = D, y = \text{coefficients}$

$N > D, y = 0$

$N < D, \text{none!}$

$H.A. = y = 0$

Homework is on Page 4.5 in Packet