Class Discussion

Unit 2 Topic 6 Rational Functions

Objective: Definition of a rational function and its characteristics (H.A., V. A. , and holes)

Rational function

$f(x)$ is a rational function if, both $N(x)$ and $D(x)$ are polynomials and $f(x)=\frac{N(x)}{D(x)}$

Horizontal asymptotes:

$y=c$ (c is a constant) is a horizontal asymptote : if $x\to\infty$ or $x\to-\infty$, $f\to c$

Vertical asymptotes:

$x=c$ (c is a constant) is a vertical asymptote, if $x=c$ is a zero of $D(x)=0$ but not a zero of $N(x)=0$.

Holes:

Rational function $f(x)$ has a hole when $x=c$, if $x=c$ is a zero of both $N(x)=0$ and $D(x)=0$

x-intercept:

$(c,0)$ is an x-intercept of $f(x)$ if , if $x=c$ is a zero of $N(x)=0$ but not a zero of $D(x)=0$.

Ex: Graph the following rational function. Identify (locate) the holes of the rational function if exists.

$$f(x)=\frac{6x^2+11x+3}{3x^2+7x+2}$$