Day 15 Notes

Thursday, October 1, 2015 8:29 PM

Precalculus
2.6 Day 3 – Graphs of Rational Functions (Slant Asymptotes)

Name:
Period:

A quick review...

Define the horizontal asymptote of $f(x)=\frac{x^2-2x-3}{x-5}$ ... No Horizontal Asymptote!

*** **If the degree in the numerator is exactly** one degree Higher **than the degree in the denominator, we have a** Slant asymptote (Linear/line) ***

To find a slant asymptote:

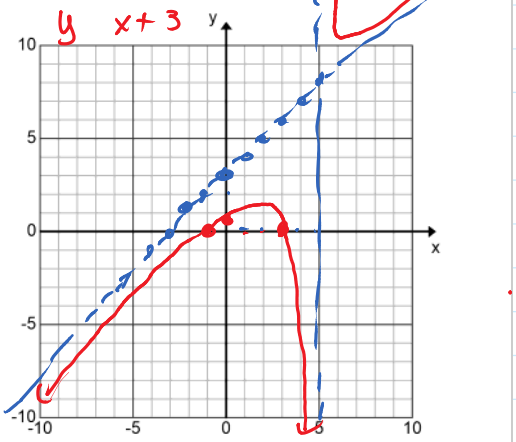
1. Perform synthetic (or long) division to find the quotient.
2. Regardless of the remainder, set the quotient equal to y. This is your slant asymptote. ($y=mx+b$)
3. Graph the linear asymptote.

A few examples:

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

$5 \mid 1 \;-2\;-3$
$\quad\;\; 5 \;\; 15$
$1 \;\; 3 \mid 12$

$y = x+3$



→ V. A.: $x=5$

H.A. : x

S.A.: $y=x+3$

→ Remov. Disc.: x

→ x-intercept(s): $(3,0)$ $(-1,0)$

→ y-intercept: $(0, 3/5)$

Behavior around the V.A.:

2. $g(x)=\dfrac{x^2-3x-10}{x+1}$

$(x-5)(x+2)$

$-1 \mid 1 \;-3 \;-10$
$\quad\quad\;\; -1 \;\; 4$
$1 \;\; -4$

V. A.: $x=-1$

H.A. : X

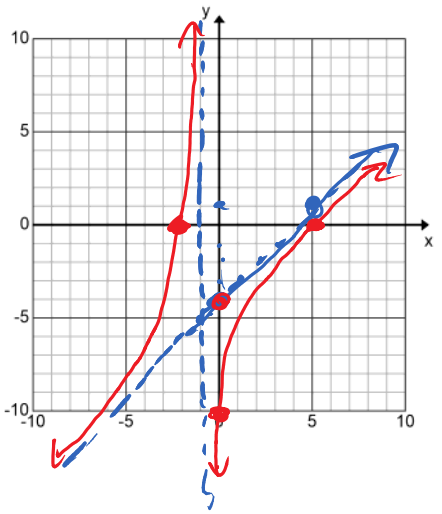
S.A.: $y=x-4$

Remov. Disc.: X

x-intercept(s): $(5,0)\ (-2,0)$

y-intercept: $(0,-10)$

Behavior around the V.A.:



3. $h(x)=\dfrac{2x^2-3x-2}{x-3}$

$\dfrac{(2x+1)(x-2)}{x-3}$

V. A.: $x=3$

H.A. : X

S.A.: $y=2x+3$

Remov. Disc.: X

x-intercept(s): $(-\frac{1}{2},0)\ (2,0)$

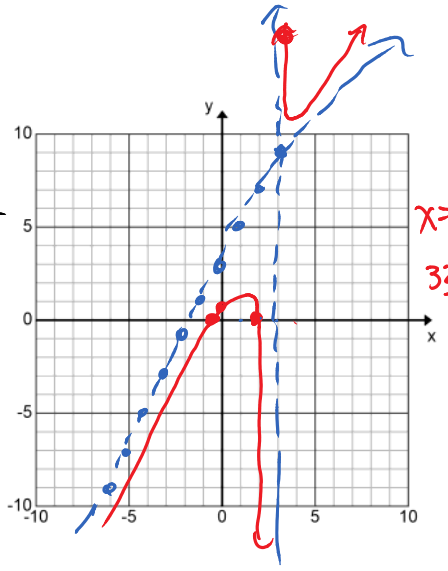
y-intercept: $(0,2/3)$

Behavior around the V.A.:

$\dfrac{2(25)-3(5)-2}{5-3}$

$\dfrac{50-15-2}{2}$

$\dfrac{33}{2}$



$x=4$

$\dfrac{32-12-2}{1}$

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