

SAT

If $x/y = 3$ and $x = 12$, then $x-y = ??$

Organize the homework from last class:

H.A. at $y=0$	H.A. at $y = a$	No H.A.
$f(x) = \frac{x+1}{x^2-x-12}$ $f(x) = \frac{-5}{x^2-4}$ $f(x) = \frac{1}{x+3}$ $f(x) = \frac{5-2x}{x^2+3x}$	$f(x) = \frac{4x^2-25}{x^2-1}$ $f(x) = \frac{4x-1}{2x-1}$ $f(x) = \frac{x^2+2x-3}{x^2-2x-3}$	$f(x) = \frac{x^2-x-6}{x-1}$

$$f(x) = \frac{x+1}{x^2-x-12}$$

$$f(x) = \frac{-5}{x^2-4}$$

$$f(x) = \frac{1}{x+3}$$

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

$$f(x) = \frac{4x^2-25}{x^2-1}$$

$$f(x) = \frac{4x-1}{2x-1}$$

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

$$f(x) = \frac{x^2-x-6}{x-1}$$

What can we conclude?

degree of numerator $<$ degree of denominator means:

HA @ $y=0$

degree of numerator = degree of denominator means:

HA @ $y=a$ (a is ratio of leading coeff)

degree of numerator $>$ degree of denominator means:

no HA

degree of numerator < degree of denominator

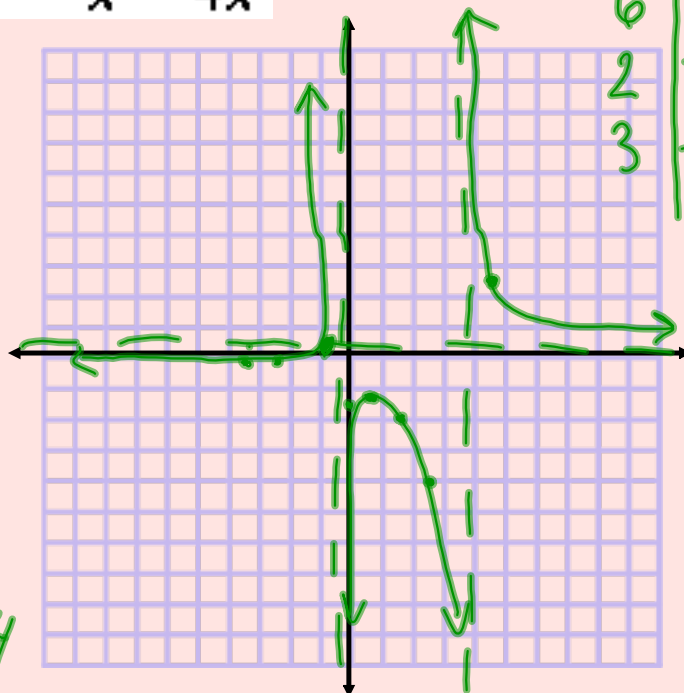
$$f(x) = \frac{4x + 1}{x^2 - 4x}$$

HA: $y=0$

y-int: none

x-int: $4x + 1 = 0$
 $x = -\frac{1}{4}$

VA: $x^2 - 4x = 0$
 $x(x - 4) = 0$
 $x = 0, x = 4$



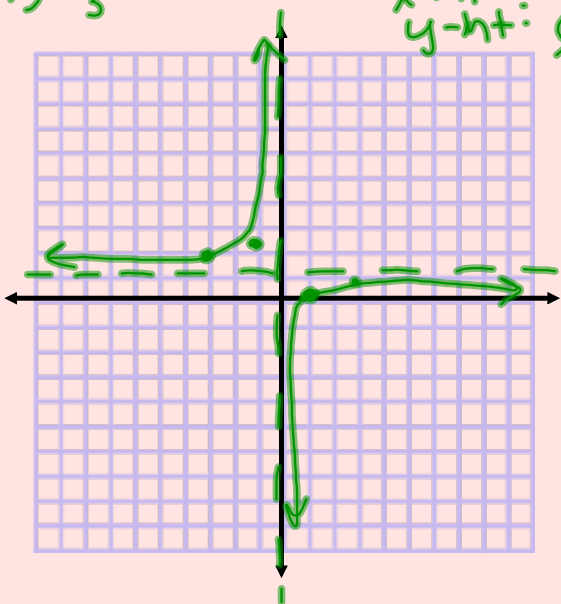
x	y
1	$-\frac{5}{3}$
6	$\frac{25}{12}$
2	$-\frac{1}{4}$
3	$-\frac{13}{3}$

degree of numerator = degree of denominator

x	y
-1	2
3	2/3
-3	4/3

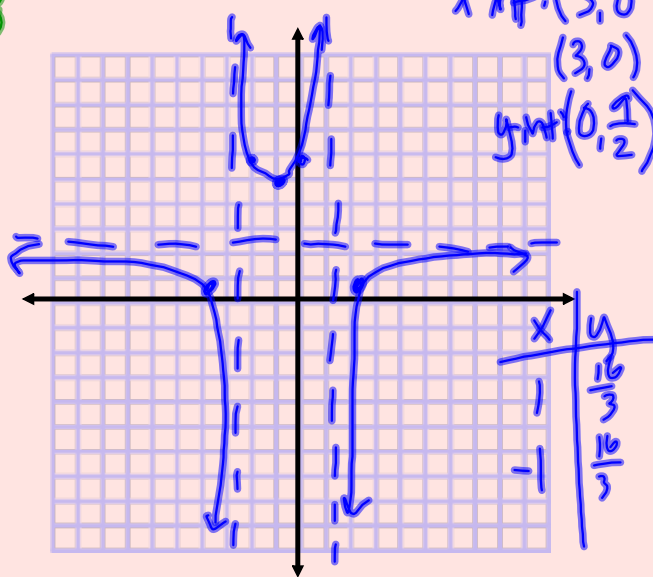
$$f(x) = \frac{|x-1|}{|x|}$$

HA: $y=1$
 VA: $x=0$
 x-int: $(1, 0)$
 y-int: $(0, 0)$



$$f(x) = \frac{2(x^2 - 9)}{x^2 - 4}$$

HA: $y=2$
 VA: $x=2$
 $x=-2$
 x-int: $(-3, 0)$
 $(3, 0)$
 y-int: $(0, 1/2)$

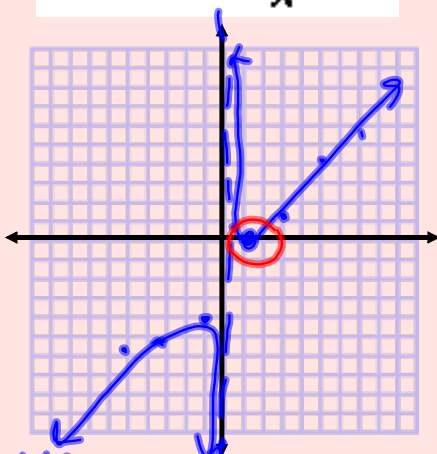


x	y
-1	3/6
1	3/6

degree of numerator > degree of denominator

no HAs!

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



VA: $x=0$

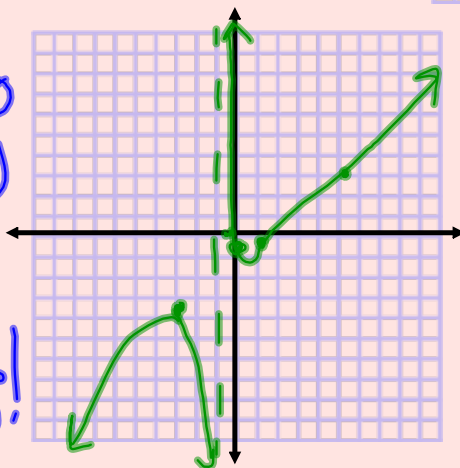
x-int: $(x-1)(x-1)=0$
 $x=1$ (1,0)

y-int: \emptyset

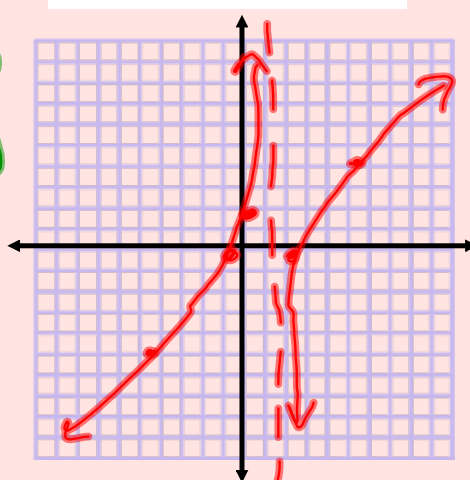
Plug in to get pts!

VA: $x=-1$
 x-int: $x(x-1)=0$
 (0,0) (1,0)
 y-int: (0,0)

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



$$f(x) = \frac{(x+1)(x-2)}{x-1}$$



VA: $x=1$
 x-int: (2,0) (-1,0)
 y-int: (0,2)

Homework #9-10 from last night: What kind of Horizontal Asymptote?

$$f(x) = \frac{6x^2 - 3x}{2x^2 + 2x - 8}$$

$$y=3$$

$$f(x) = \frac{x+3}{x^2-9}$$

$$y=0$$

Graph by Hand!

$$f(x) = \frac{2x^2 - 2}{x^2 - 4}$$

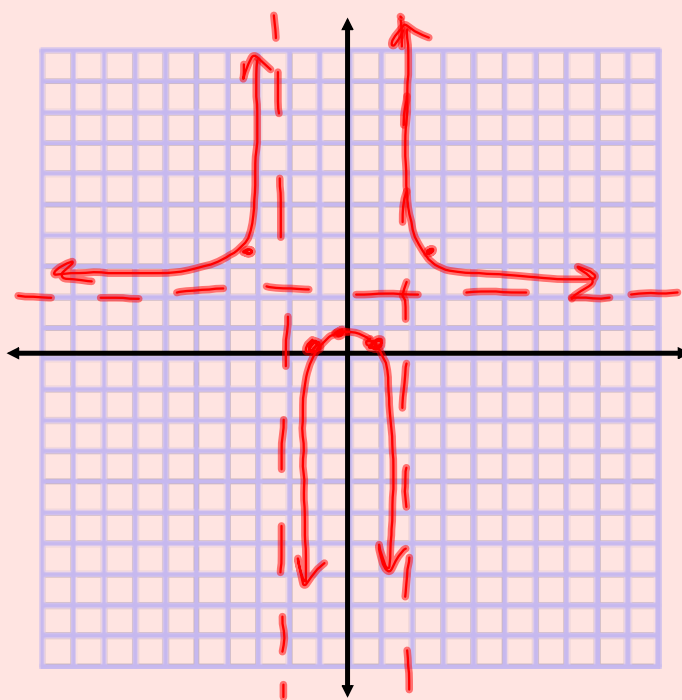
VA: $x=2, x=-2$

HA: $y=2$

x-int: $(1,0), (-1,0)$

y-int: $(0, \frac{1}{2})$

x	y
3	3/2
3	3/2



Homework Assignment: page 314 (39-52)

Graph each one accurately.
Use analytical methods to determine the asymptotes, zeros, and y-intercept.