

Questions:

Notes:

Ex 1 IDENTIFY THE HORIZONTAL AND VERTICAL ASYMPTOTES, STATE THE DOMAIN AND RANGE.

$$y = \frac{4}{x-3}$$

x	y
1	$\frac{4}{1-3} = -2$
-1	-

vertical asymptotes occur when the denom. equals zero

$$x-3=0 \text{ solve for } x$$

$$x=3$$

horizontal asymptote (look at degrees)

$$\frac{x^0}{x^1} \quad 0 < 1 \quad \text{top} < \text{bottom}$$

$$y=0$$

$$D: \{x \mid x \neq 3\}$$

$$R: \{y \mid y \neq 0\}$$

What if our function is

$$y = \frac{4}{x-3} + 2 \quad ?$$

horiz:

$$x=0 \rightarrow x=3$$

vertical asymptote

graph shifts right 3 units

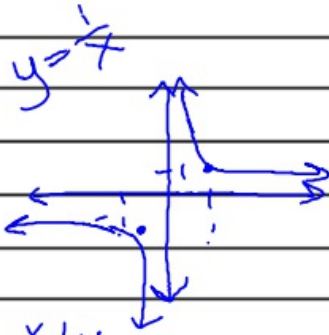
shifts up 2 units

vertical shift of horizontal asymptote

$$D: \{x \mid x \neq 3\}$$

$$y=0 \rightarrow y=2$$

$$R: \{y \mid y \neq 2\}$$



x	y
1	4
-1	-4

$$y = \frac{4}{x-3} + 2$$

Questions:

Notes: RATIONAL FUNCTIONS OF THE

FORM $y = \frac{ax+b}{cx+d}$

VERTICAL ASYMPTOTES:

OCCUR WHEN DENOMINATOR IS 0

$cx+d=0$

$cx=-d$

$x = -d/c$

HORIZONTAL ASYMPTOTES:

$\frac{ax'+b}{cx'+d}$

$1=1$

top=bottom

asymptote: $y = \frac{a}{c}$

EX2) FOR THE FUNCTION $y = \frac{x+1}{2x-4}$

a. sketch the graph

b. find the asymptotes

c. State Domain and Range

b. vertical asymptote: $D: \{x | x \neq 2\}$

$2x-4=0$

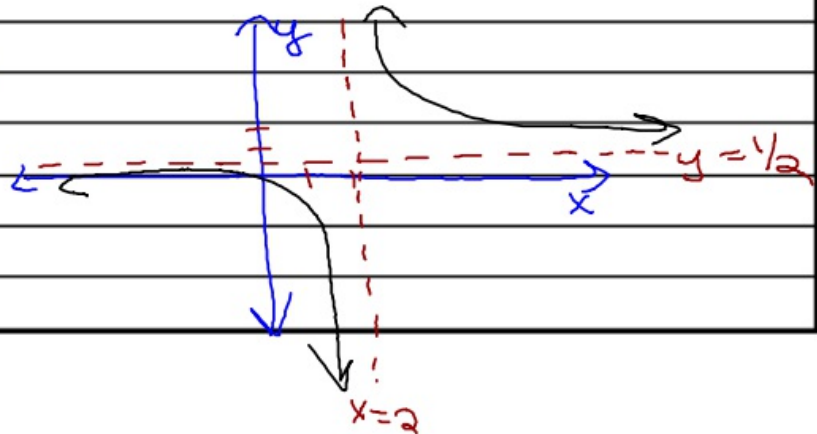
$2x=4$

$x=2$

horizontal asymptote: $R: \{y | y \neq 1/2\}$

$\frac{x+1}{2x-4} y = \frac{1}{2}$

a.



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