

OBJECTIVE: I can graph a rational function.

STEPS

1. Factor = Find V.A.
2. Find H.A or O.A.

Rules:

3. find x-int
4. find y-int
5. graph the above
6. graph V.A., holes, x-int on number line (sign array)
7. test each section in sign array

8. graph pos/neg parts
 neg pos neg pos



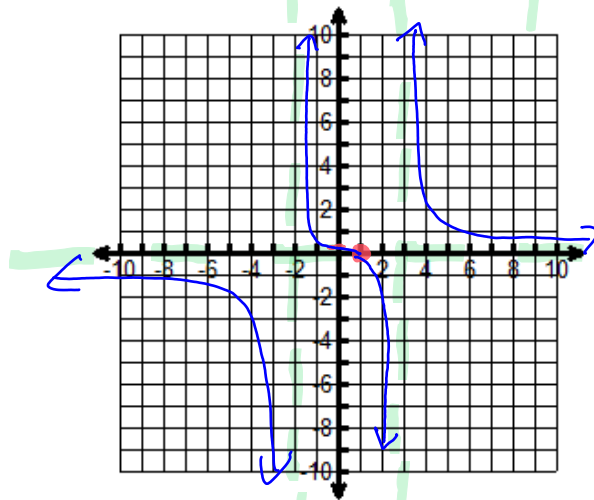
vertical asymptote: $x=3$
 $x=-2$

horizontal or oblique asymptote: $y=0$

x-intercept: $(1,0)$

y-intercept: $(0, \frac{1}{6})$

Domain: $(-\infty, -2) \cup (-2, 3) \cup (3, \infty)$
 Hole: none



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

vertical asymptote:

$x=2$
 $x=-2$

horizontal or oblique asymptote:

$y=2$

x-intercept:

$(-1, 0)$

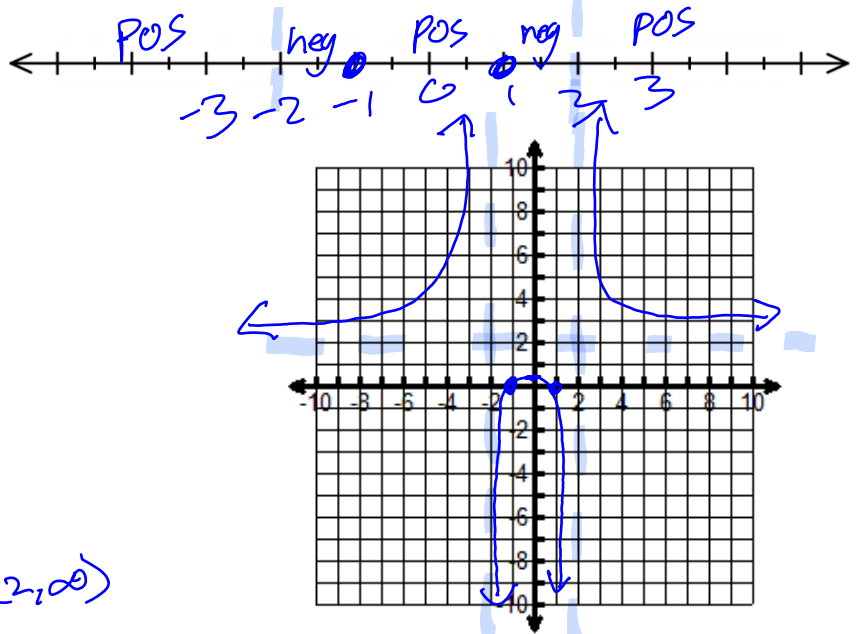
$(1, 0)$

y-intercept:

$(0, \frac{1}{2})$

Domain: $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

Hole: none



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

vertical asymptote:

$x=-2$

horizontal or oblique asymptote:

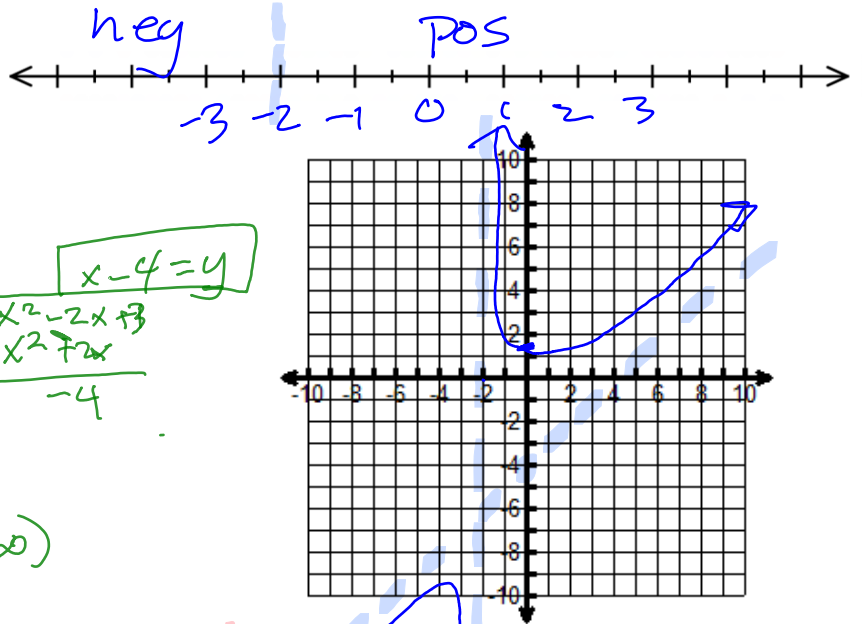
$x-4=y$
$$\begin{array}{r} x+2 \sqrt{x^2-2x+3} \\ -x^2+2x \\ \hline -4 \end{array}$$

x-intercept: none

y-intercept: $(0, \frac{3}{2})$

Domain: $(-\infty, -2) \cup (-2, \infty)$

Hole: none



4. $f(x) = \frac{x-3}{x^2-9} = \frac{x-3}{(x-3)(x+3)} = \frac{1}{x+3}$

vertical asymptote:

$x=-3$

horizontal or oblique asymptote:

$y=0$

x-intercept: none

y-intercept: $(0, \frac{1}{3})$

Domain: $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

Hole: $(3, \frac{1}{6})$

