

Consider the graph of this rational function:

$$r(x) = \frac{(x+2)^2(x-5)}{(x-3)(x+1)(x+4)}$$

$$\text{HA } y=1$$

Find

The x-intercepts. Write them as ordered pairs (x, y)

$$\text{Dbl Zero } (-2, 0) \text{ and } (5, 0)$$

Consider the vertical asymptotes. Write them as equations of vertical lines

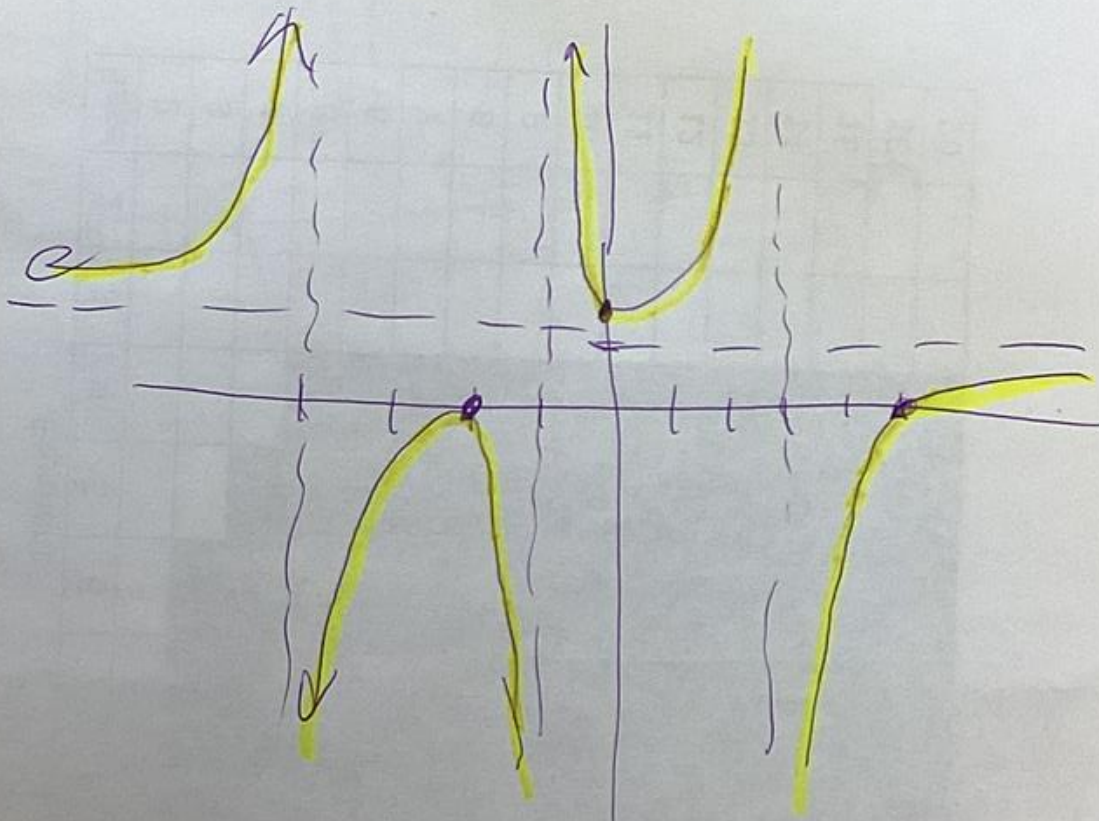
$$x=3 \quad x=-1 \quad x=-4$$

Find the y-intercept. Write them as ordered pairs (x, y)

$$\left(0, \frac{5}{3}\right)$$

$$\frac{4(-5)}{(3)(4)} = \frac{-20}{-12}$$

Make a sketch of this rational Function



Consider the graph of this rational function:

$$y = \frac{x^2 - 2x + 1}{x^2 + 2x - 8}$$

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

Find

The x-intercepts. Write them as ordered pairs (x, y)

$$(-1, 0) \text{ Dbl root}$$

Consider the vertical asymptotes. Write them as equations of vertical lines

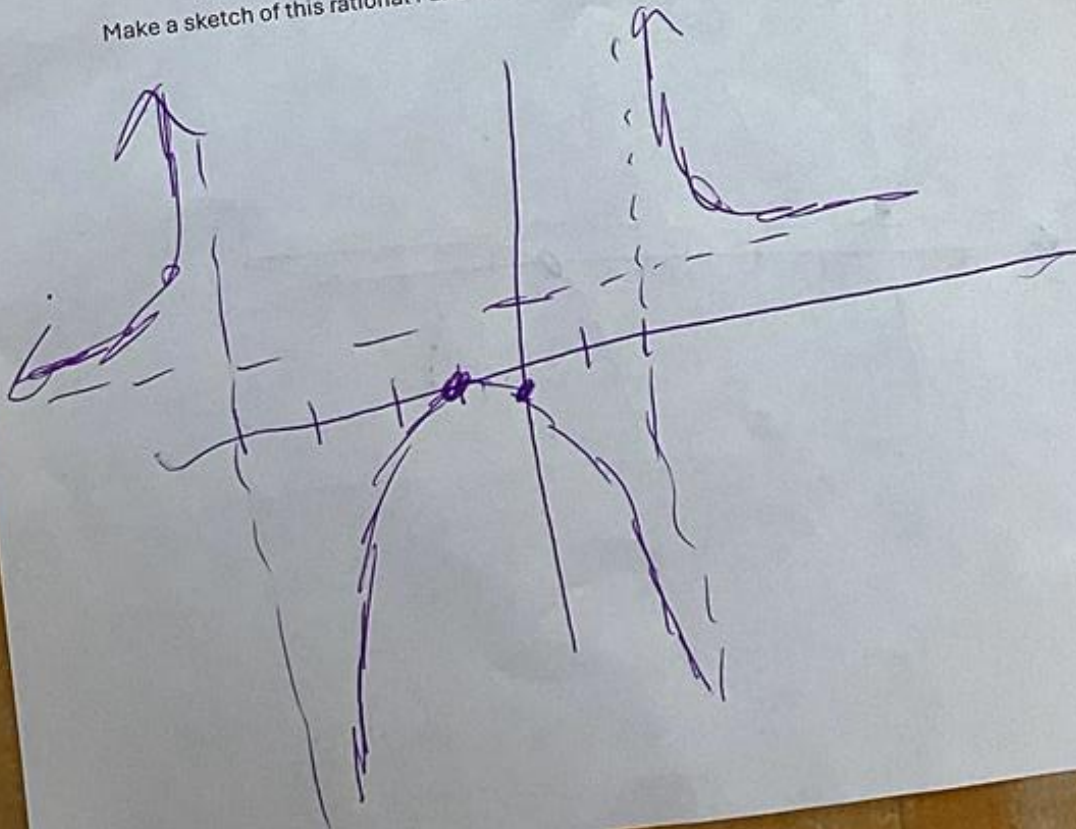
$$x = -4 \quad x = 2$$

Find the y-intercept. Write them as ordered pairs (x, y)

$$(0, -\frac{1}{8})$$

$$y = 1 \text{ is an HA}$$

Make a sketch of this rational function



Write a rational function that has these characteristics:

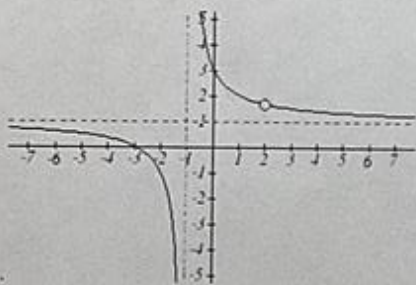
Vertical asymptotes at $x = -3$ and $x = 6$

x intercepts at $(-2, 0)$ and $(1, 0)$

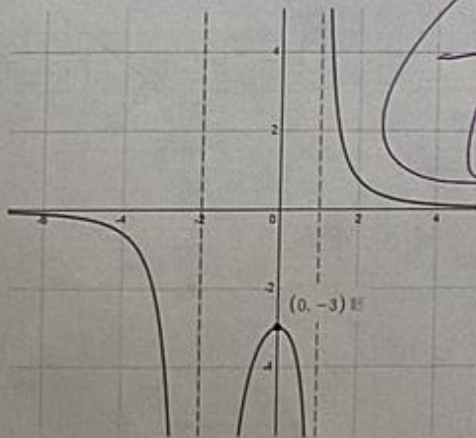
Horizontal asymptote at $y = -2$

$$y = \frac{-2(x+2)(x-1)}{(x+3)(x-6)}$$

Write a rational function that has this graph



$$y = \frac{(x+5)(x-2)}{(x+1)(x-2)}$$



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

$$\frac{a}{(-1)(4)} = -3$$

$$a = 12$$