

## Do Now: #4 from yesterday's sheet

Solve each rational equation graphically:

- Sketch a complete graph of the function showing all intercepts and asymptotes
- Write the window settings you use on the calculator
- Find the solution set of the given equation (Round answers to 3 decimal places)

$$4) \frac{3}{x-1} + \frac{2}{x} = 8$$

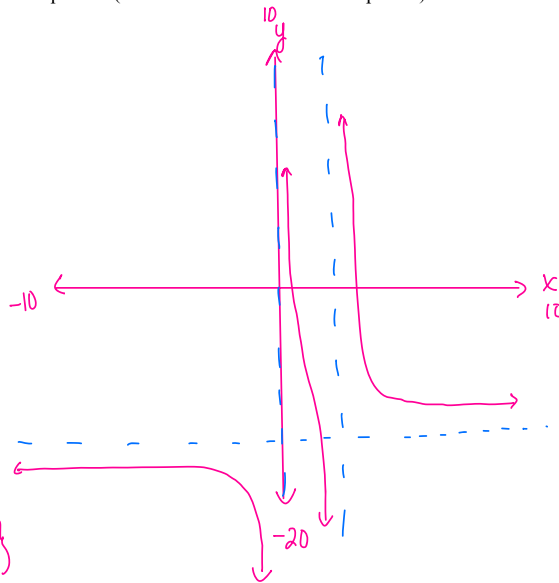
$$\frac{3}{x-1} + \frac{2}{x} - 8 = 0$$

$$y = \frac{3}{x-1} + \frac{2}{x} - 8$$

$$\text{PVA: } x = 0, 1$$

$$\text{EB: } y = 0 + 0 - 8 = -8$$

$$\{.172, 1.453\}$$



## Wrapping up yesterday's classwork...

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

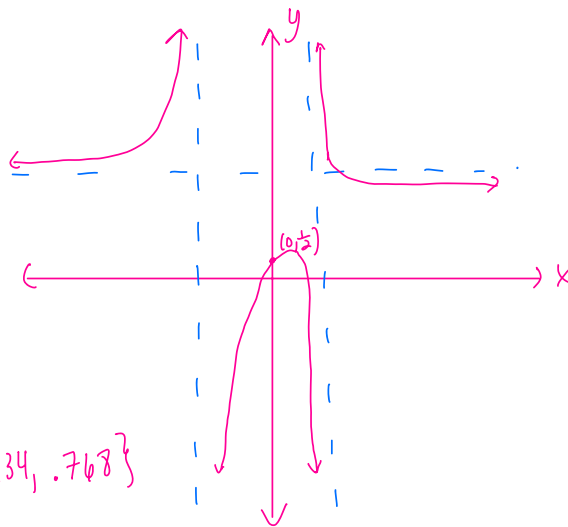
$$\frac{3x}{x+2} + \frac{2}{x-1} - \frac{5}{x^2+x-2} = 0$$

$$y = \frac{3x}{x+2} + \frac{2}{x-1} - \frac{5}{(x+2)(x-1)}$$

$$\text{PVA: } x = -2, 1$$

$$\text{EB: } y = 3 + 0 + 0 = 3$$

$$\{-.434, .768\}$$

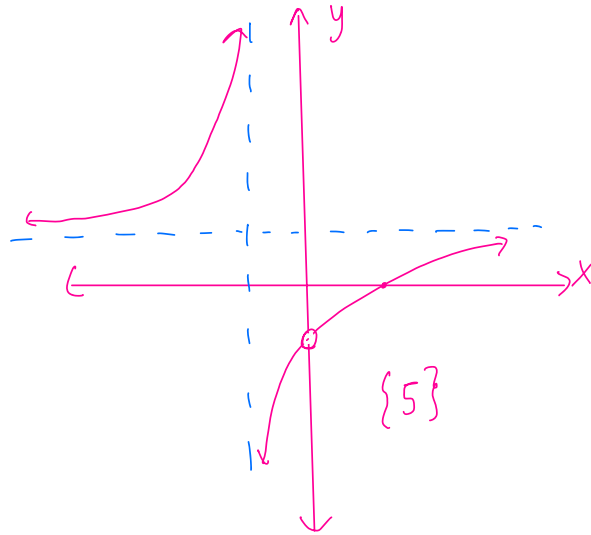


$$6) \frac{x-3}{x} - \frac{3}{x+1} + \frac{3}{x^2+x} = 0$$

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

PVA:  $x = -1$ , hole

$$EB: y = 1 - 0 + 0 = 1$$



**Steps to solving rational equations graphically:**

1. set it = 0 to  
find PVA and EB
2. input into y =  
(using `alpha` `y=` helps with fraction inputting)
3. calculate zeros of function  
(`2nd` `Trace`, left bound, `enter` right bound, `enter`,  
guess, `enter`)

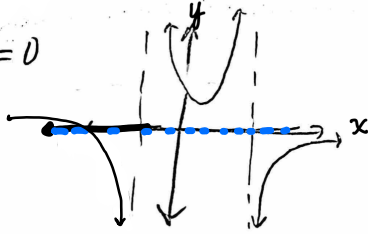
Also don't forget y-intercept  
(`2nd` table  $x=0$ )

## Homework 01-02

$$\textcircled{2} \quad \frac{3}{n+1} - \frac{5}{n-3} = 0$$

EB  $y=0$   
PVA  $n = -1, 3$

$$\{-1, 3\}$$

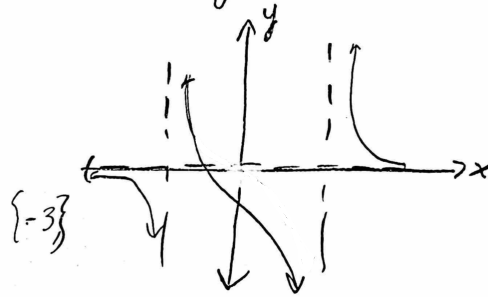


$$\textcircled{1} \quad \frac{1}{x-5} + \frac{1}{x-5} = \frac{4}{x^2-25}$$

$$\frac{1}{x-5} + \frac{1}{x-5} - \frac{4}{x^2-25} = 0$$

PVA  $x = \pm 5$

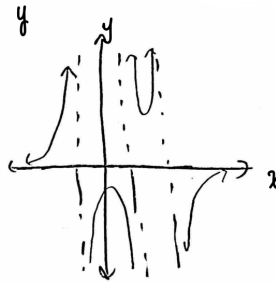
EB  $y=0$



$$\frac{3}{x-1} - \frac{4}{x-2} - \frac{2}{x+1} = 0$$

⑥ PVA  $x = \pm 1, 2$   $\emptyset$

EB  $y=0$



Just so you see algebraically:

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

$$3x^2-3x-6-4x^2+4 = 2x^2-6x+4$$

$$-x^2-3x-2 = 2x^2-6x+4$$

$$0 = 3x^2-3x+6$$

$$0 = 3(x^2-x+2)$$

$$x^2-x+2=0$$

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

$$x = \frac{1 \pm \sqrt{-7}}{2}$$

$$\frac{1 \pm i\sqrt{7}}{2}$$

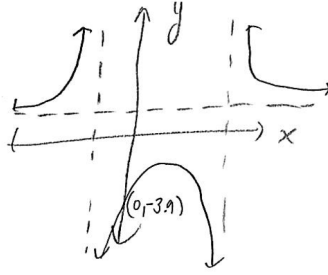
$$\textcircled{D} \frac{c+2}{c-5} - \frac{7}{c+2} = 0$$

let  $x=c$

PVA  $x=5, -2$

EB  $y=1-0=1$

$\emptyset$



Again algebraically:

$$c^2 + 4c + 4 = 7c - 35$$

$$c^2 - 3c + 39 = 0$$

$$c = \frac{3 \pm \sqrt{9 - 4(1)(39)}}{2(1)} \quad \text{imaginary roots}$$