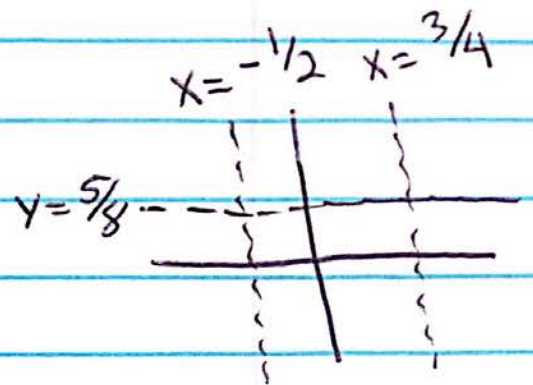


## 4.4 mini lecture

$$\textcircled{1} \quad g(x) = \frac{5x^2}{8x^2 - 2x - 3}$$



$$8x^2 - 2x - 3 = 0$$

$$(4x - 3)(2x + 1) = 0$$

$$x \neq \frac{3}{4}, \quad x \neq -\frac{1}{2}$$

$$\boxed{(-\infty, -\frac{1}{2}) \cup (-\frac{1}{2}, \frac{3}{4}) \cup (\frac{3}{4}, \infty)}$$

$$\textcircled{2} \quad h(x) = \frac{12x^2 + x - 5}{3x + 4}$$

$$n = m + 1 \text{ (oblique)}$$

$\boxed{\text{No horizontal}}$

4.4 min: lecture

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

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

vertical:  $x(x+1) = 0$

$x=0, x=-1$

horizontal:  $\frac{x^2}{x^2} \quad n=m$

$y=1$

oblique:  $n=m+1 \quad \underline{\underline{n=m}}$

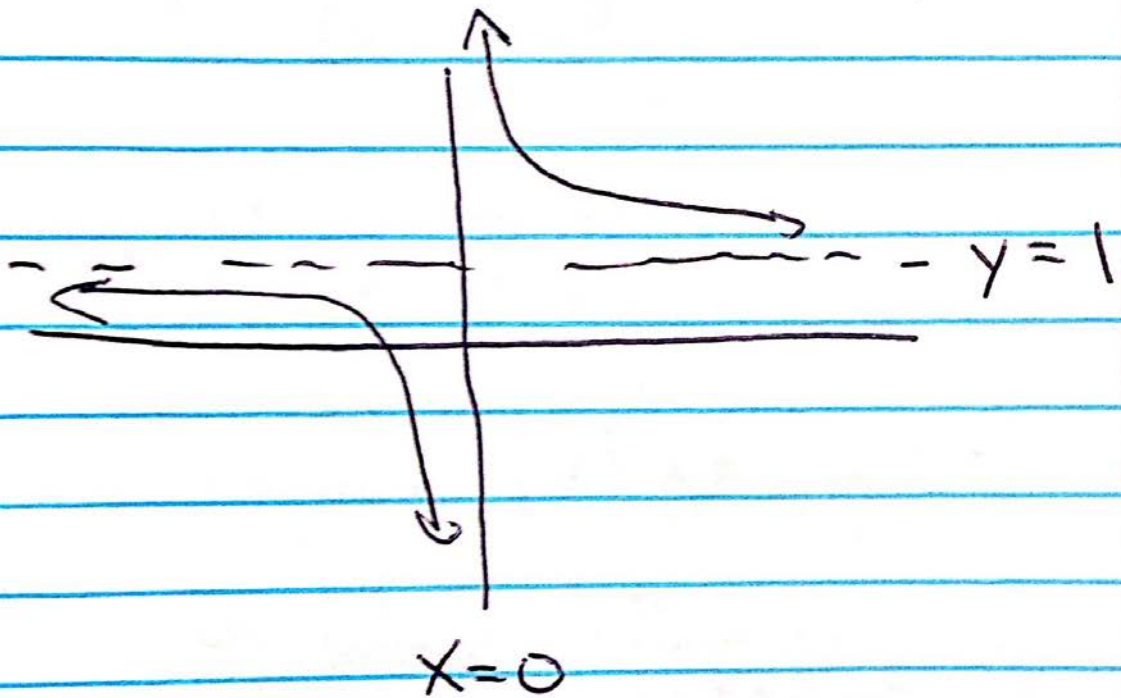
no oblique ←

4.4 min. Lecture

④  $f(x) = \frac{x+2}{x}$

V:  $x=0$

H:  $y=1$



## 4.5 mini lecture

$$\textcircled{1} \quad f(x) = \frac{-3}{(x-1)(x^2-4)}$$

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

A) Domain  $\{x \mid x \neq 1, x \neq 2, x \neq -2\}$

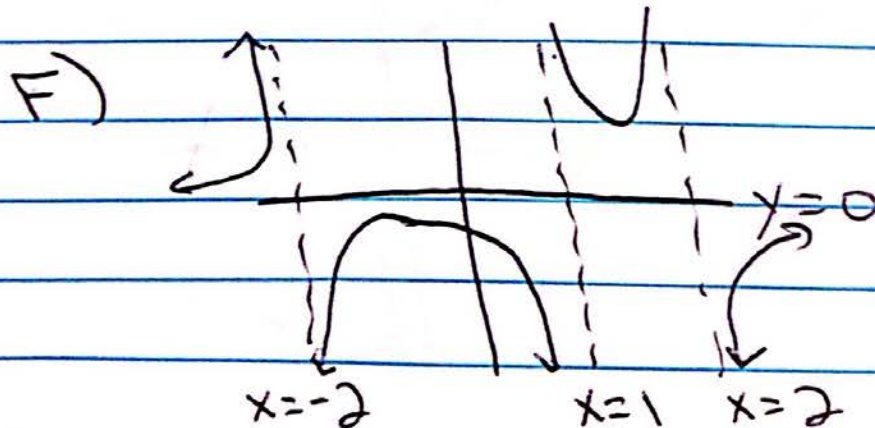
B) Factor  $\frac{-3}{(x-1)(x+2)(x-2)}$

C) x-intercepts (none)

y-intercepts (-0.75)

D) vertical asymptotes  $x=1, x=-2,$

E) horizontal asymptotes  $y=0$



## 4.5 mini lecture

$$\textcircled{2} f(x) = 2x + \frac{4}{x}$$

$$\frac{2x^2 + 4}{x}$$

$$VA: x=0$$

$$\text{Oblique: } \cancel{y=2x} \\ y=2x$$

$$\begin{array}{r} 2x \\ x \overline{) 2x^2 + 4} \\ \underline{-2x^2} \phantom{+4} \\ \phantom{-2x^2} +4 \end{array}$$

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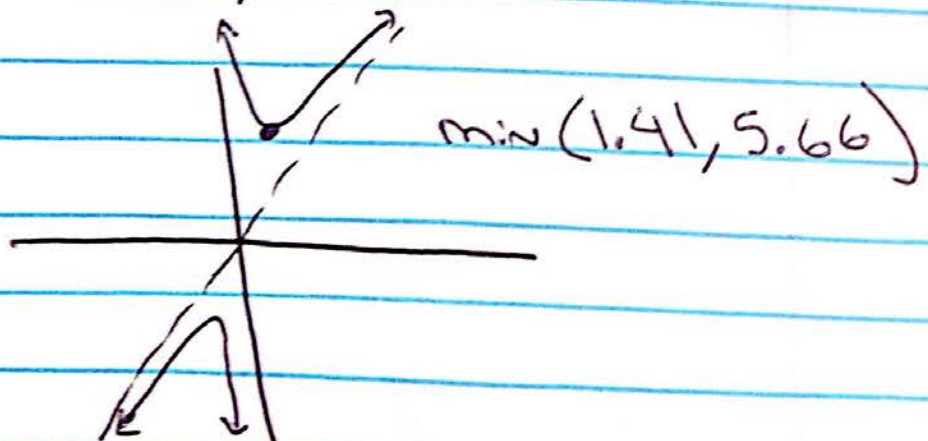
$$\frac{2x^2 + 4}{x} = 2x$$

$$2x^2 + 4 = 2x^2$$

$4 = 0$  impossible

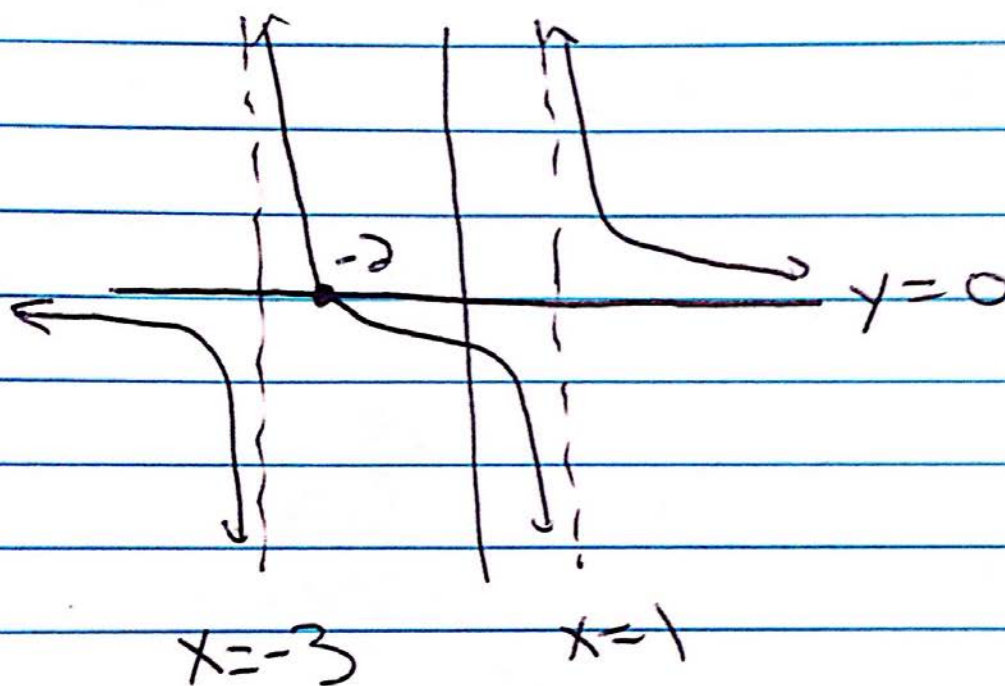
\* does not intersect \*

$$y = 2x$$



## 4.5 min. Lecture

③



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

## 4.5 mini lecture

④

$$A) C(x) = 200,000 + 2500x$$

$$B) \bar{C}(x) = \frac{200,000 + 2500x}{x}$$

$$C) \frac{200,000 + 2500(1000)}{1000}$$

$$= 2700$$

$$D) y = 2500$$

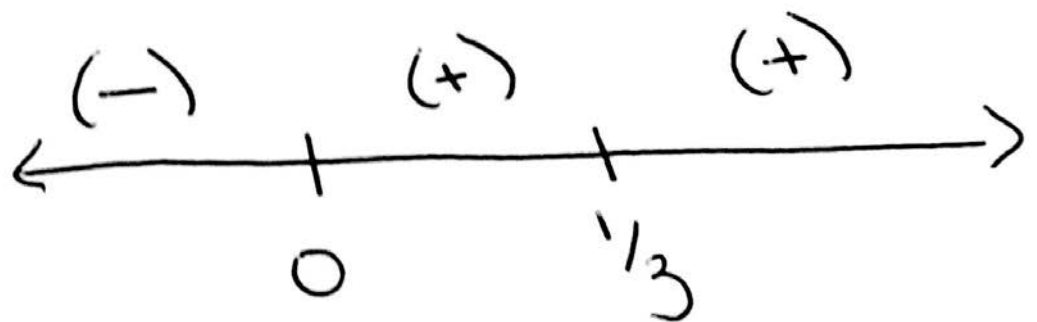
## 4.6 mini lecture

$$\textcircled{1} \quad 9x^3 - 6x^2 + x < 0$$

$$x(9x^2 - 6x + 1) < 0$$

$$x(3x - 1)(3x - 1) < 0$$

critical points  $x = 0, \frac{1}{3}$



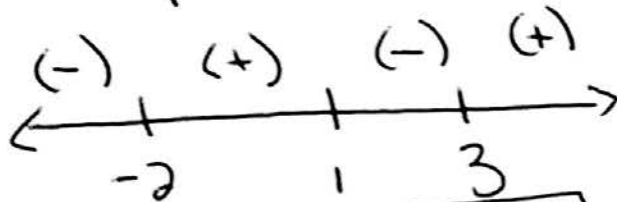
$$\boxed{(-\infty, 0)}$$



## 4.6 min: lecture

$$\textcircled{2} \frac{(x-1)(x+2)}{(x-3)} \geq 0$$

critical points  $x=1, -2, 3$



$$\boxed{[-2, 1] \cup (3, \infty)}$$

$$\textcircled{3} x + \frac{8}{x} \leq 6$$

critical point  $x=0$

$$x^2 + 8 \leq 6x$$

$$x^2 - 6x + 8 \leq 0$$

$$(x-4)(x-2) \leq 0$$

critical points  $x=4, 2$



$$\boxed{(-\infty, 0) \cup [2, 4]}$$

#### 4.6 mini lecture

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

$$9x^2 - 4 \geq 0$$

$$(3x+2)(3x-2) \geq 0$$

critical points  $x = -2/3, 2/3$



$$\boxed{(-\infty, -2/3] \cup [2/3, \infty)}$$