EI #5 $R(x) = \dfrac{3x^3-14x^2+23x-10}{x^2-x-2}$ $\dfrac{(x-2)(x+1)}{}$

No H.A. $\dfrac{3x^3\ldots}{x^2}$

D: $\mathbb{R} \setminus \{-1, 2\}$

& No Holes

→ V.A.: $x=-1,\ x=2$

O.A.

$y = 3x-11$

$x^2-x-2 \overline{)\ 3x^3-14x^2+23x-10}$

$-(3x^3-3x^2-6x)$

$3x-11$

$\dfrac{3x^3}{x^2} = 3x$

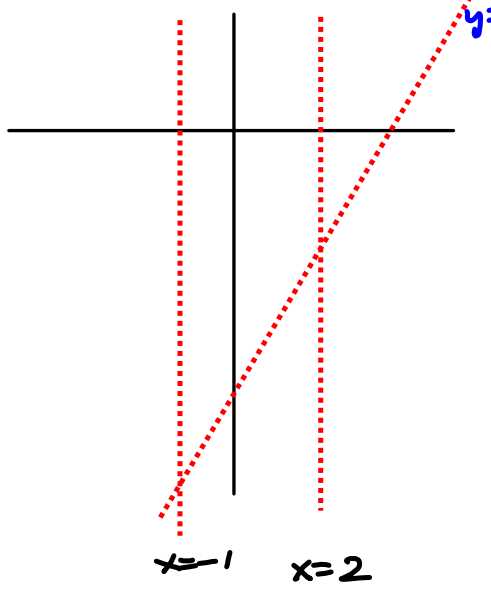
$\dfrac{-11x^2}{x^2} = -11$

$-11x^2$

$y=3x-11$

$3x-11=0$

$x = \frac{11}{3} = 3\frac{2}{3}$



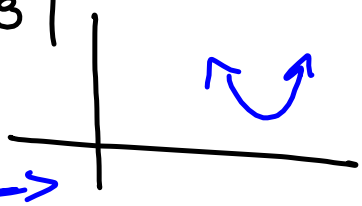
E3 #6

$g(x) = x^2 - 2x - 8$, $h(x) = 2x^2 - 3x + 15$

Vertical Distance : $|g(x) - f(x)| = |f(x) - g(x)|$

$d = |2x^2 - 3x + 15 - x^2 + 2x + 8|$

$= |x^2 - x + 23|$



$a=1, b=-1, c=23 \rightarrow$

$b^2 - 4ac = (-1)^2 - 4(1)(23) < 0 \rightarrow$

No real solns

$= x^2 - x + 23 \rightarrow$

$d' = 2x - 1 \overset{\text{SET}}{=} 0 \rightarrow \boxed{x = \frac{1}{2}} \rightarrow$

$d = (\frac{1}{2})^2 - (\frac{1}{2}) + 23$

$= \frac{1}{4} - \frac{2}{4} + \frac{92}{4} = \boxed{\frac{91}{4} = \text{min dist.}}$

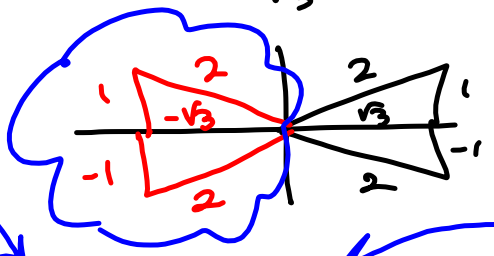
(2) $f(x) = 2\tan x - 4x$ on $(-\frac{\pi}{2}, \frac{\pi}{2})$

is odd

$f'(x) = 3\sec^2 x - 4$ SET $= 0$

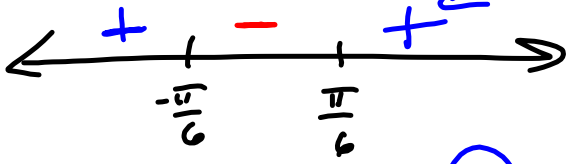
$\Rightarrow \sec^2 x = \frac{4}{3}$

$\Rightarrow \sec x = \pm\frac{2}{\sqrt{3}}$ $\Rightarrow \cos x = \pm\frac{\sqrt{3}}{2}$



30° $\frac{\pi}{6}$

-30° $-\frac{\pi}{6}$



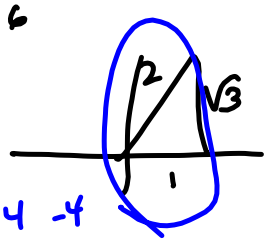
$f'(0) = -1$

$3\sec^2(\frac{\pi}{3}) - 4$

$= 3\left(\frac{2}{1}\right)^2 - 4 = 8$

$= -4 = 0$

Test: $x = -\frac{\pi}{3}$

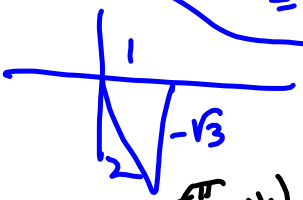


$3\sec^2(-\frac{\pi}{3}) - 4 = 3\cdot 4 - 4$

$= +$

$3\sec^2(0) - 4$

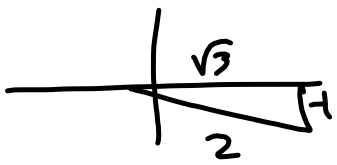
$= 3 - 4 = -1$



$(\frac{\pi}{6}, *)$

$(\frac{\pi}{6}, *)$

On re-take, I want this to be: Find local max & min-



$f(-\frac{\pi}{6}) = 3\tan(-\frac{\pi}{6}) - 4(-\frac{\pi}{6})$

$= 3(-\frac{1}{\sqrt{3}}) + \frac{2\pi}{3} = \boxed{-\frac{3}{\sqrt{3}} + \frac{2\pi}{3}}$ MIN

max is $\frac{3}{\sqrt{3}} - \frac{2\pi}{3}$ by oddness.

Odd / even

$f(-x) = -f(x)$ ODD

$f(-x) = f(x)$ EVEN

$$\frac{(\text{ODD})(\text{EVEN})}{(\text{EVEN})(\text{ODD})} = \text{Even}$$

$$= \frac{(-)(+)}{(+)(-)} + -$$

Even + ODD

+ + −

Neither.

ODD + ODD = ODD

EVEN + EVEN = EVEN

EVEN + ODD = Neither.

$$\frac{(\sin x)(\cos x)}{(\tan x)(x)(x^2+2)} = \frac{(-)(+)}{(-)(+)(+)} = \text{ODD} = -$$