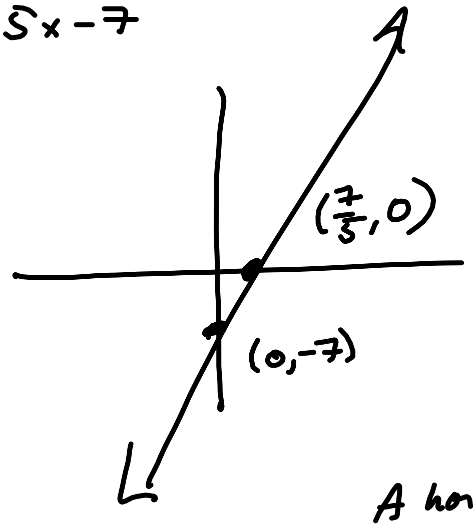
ρ ρ ρ

$\rho(x) = 5x - 7$

x	y
0	-7
1	-2
2	3
3	8
4	13

None of the y-coords repeat is NOT a general argument.



Graphical Argument

By graph, it passes the horizontal line test!

A horizontal line will intersect the graph at most once.

Suppose $\rho(x_1) = \rho(x_2)$

$\Rightarrow 5x_1 - 7 = 5x_2 - 7$

$\Rightarrow 5x_1 = 5x_2$

$$\boxed{\Rightarrow \frac{5x_1}{5} = \frac{5x_2}{5}}$$

$\Rightarrow x_1 = x_2$

C3 TEST

$\frac{f}{g}$, $f \circ g$ & their domains.

$|ax+b| < c$, etc.

one tough graph like T2 #6.
(Take-home likely)

(3) (a) $\mathcal{D}(f)$: Need $x+8 \geq 0$

$\Rightarrow x \geq -8$

$\mathcal{D} = \{x \mid x \geq -8\}$

$= [-8, \infty)$

(b) $\mathcal{D}(g) = (-\infty, \infty)$ Polynomial

(c) $\frac{f}{g} = \frac{\sqrt{x+8}}{x^2-4x-5}$

(d) $\mathcal{D}\left(\frac{f}{g}\right) = \mathcal{D}(f) \cap \mathcal{D}(g) \cap \{x \mid g(x) \neq 0\}$

$\mathcal{D}(f) \cap \mathcal{D}(g) = [-8, \infty) \cap (-\infty, \infty)$

$= [-8, \infty)$

Now $\underline{[-8, \infty) \cap \{x \mid g(x) \neq 0\}}$

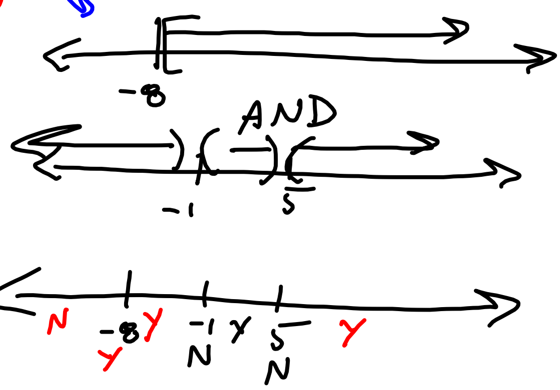
AND

$g(x) \neq 0$

$x^2-4x-5 \neq 0$

$(x-5)(x+1) \neq 0$

$x \neq -1, 5$



$= [-8, -1) \cup (-1, 5) \cup (5, \infty)$

$\mathcal{D}\left(\frac{f}{g}\right) = \{x \mid x \in \mathcal{D}(f) \overset{\cap}{\text{and}} x \in \mathcal{D}(g) \text{ and } g(x) \neq 0\}$

$= \mathcal{D}(f) \cap \mathcal{D}(g) \cap \{x \mid g(x) \neq 0\}$

3e $(f \circ g)(x) = f(g(x)) = \sqrt{\underline{x^2-4x-5} + 8}$

$f(☺) = \sqrt{☺ + 8}$

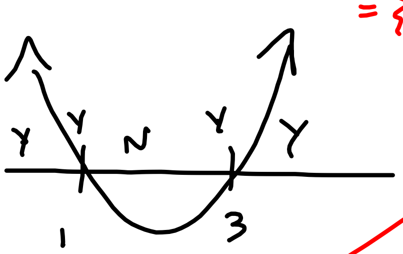
$f(\Delta) = \sqrt{\Delta + 8}$

$f(g(x)) = \sqrt{g(x) + 8}$

$\Rightarrow$

3f $\mathcal{D}(f \circ g) = \{x \mid x \in \mathcal{D}(g) \text{ and } g(x) \in \mathcal{D}(f)\}$

$= \{x \mid x \in \mathbb{R} \text{ and } g(x) \geq -8\}$



$x \in \mathcal{D}(f)$ means

$x \geq -8$

$g(x) \in \mathcal{D}(f)$ means

$g(x) \geq -8$

so need

$x^2-4x-5 \geq -8$

$x^2-4x+3 \geq 0$

Practically speaking

3e $f \circ g = \sqrt{x^2-4x-5+8}$ follow nose

$= \sqrt{x^2-4x+3}$

$\Rightarrow$ Need $x^2-4x+3 \geq 0$

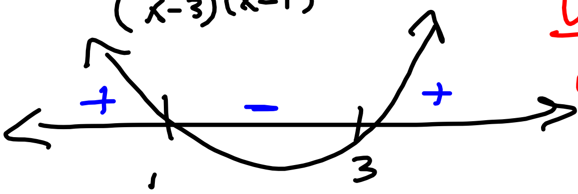
$\boxed{C3}$

$x^2-4x+3 \geq 0$

$(x-3)(x-1)$

Want ≥ 0

Want $+$ or $= 0$



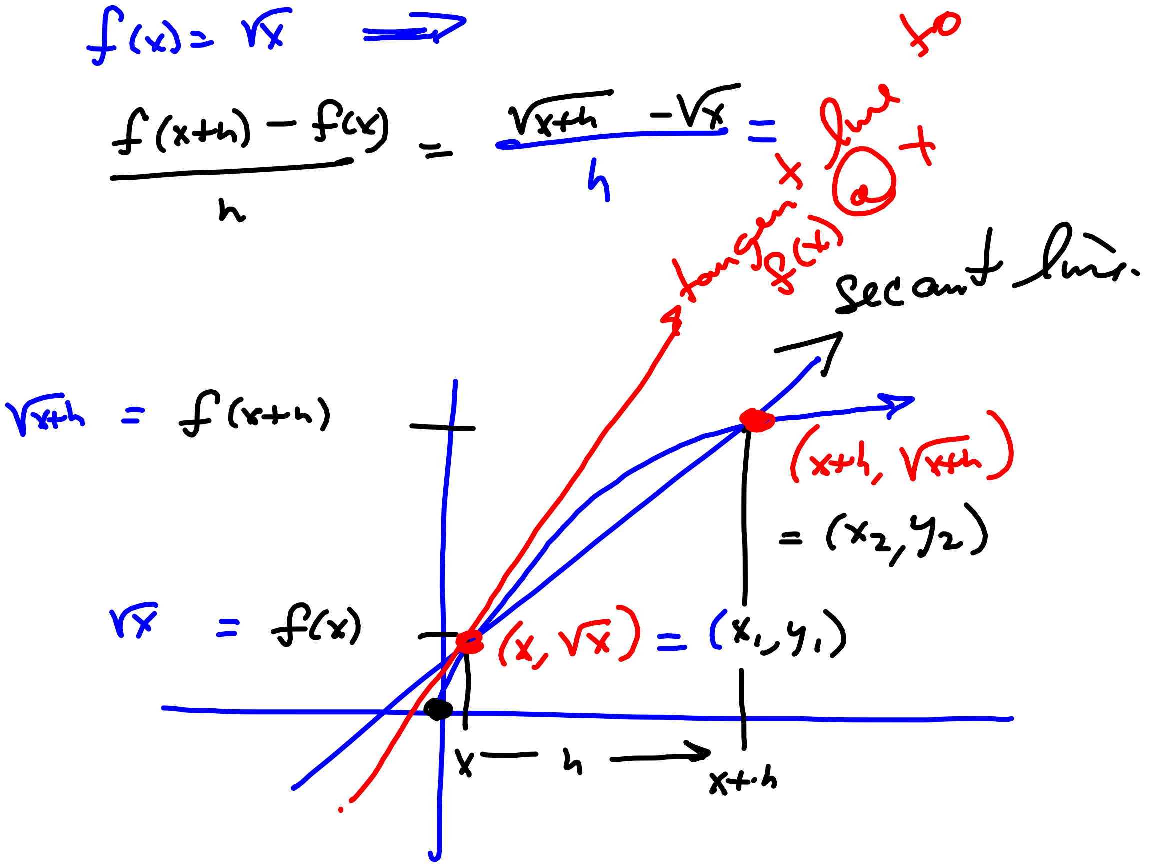
=0 N =0 Y

Y Y Y

$(-\infty, 1] \cup [3, \infty)$

$$f(x) = \sqrt{x} \implies$$

$$\frac{f(x+h) - f(x)}{h} = \frac{\sqrt{x+h} - \sqrt{x}}{h} =$$



$$\text{Slope of secant line} = m_{sec} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{\sqrt{x+h} - \sqrt{x}}{x+h - x} = \frac{\sqrt{x+h} - \sqrt{x}}{h} \text{ is}$$

the Average slope of $f(x) = \sqrt{x}$ between x & $x+h$.

#6

x-int

$$7(-2x+10)^3 - 11 = 0$$

$$7(-2x+10)^3 = 11$$

$$(-2x+10)^3 = \frac{11}{7}$$

$$\sqrt[3]{(-2x+10)^3} = \sqrt[3]{\frac{11}{7}}$$

$$-2x+10 = \sqrt[3]{\frac{11}{7}}$$

$$-2x = -10 + \sqrt[3]{\frac{11}{7}}$$

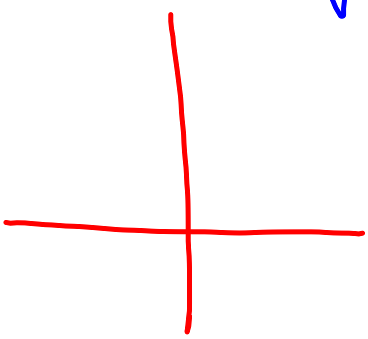
$$\boxed{x = 5 - \frac{1}{2}\sqrt[3]{\frac{11}{7}}}$$

x-int

$$\boxed{\left(5 - \frac{\sqrt[3]{539}}{14}, 0\right)}$$

$$\sqrt[3]{\frac{11}{7}} = \sqrt[3]{\frac{11}{7} \cdot \frac{7 \cdot 7}{7 \cdot 7}}$$

$$= \frac{\sqrt[3]{539}}{7}$$



$$5 - \frac{\sqrt[3]{539}}{14}$$

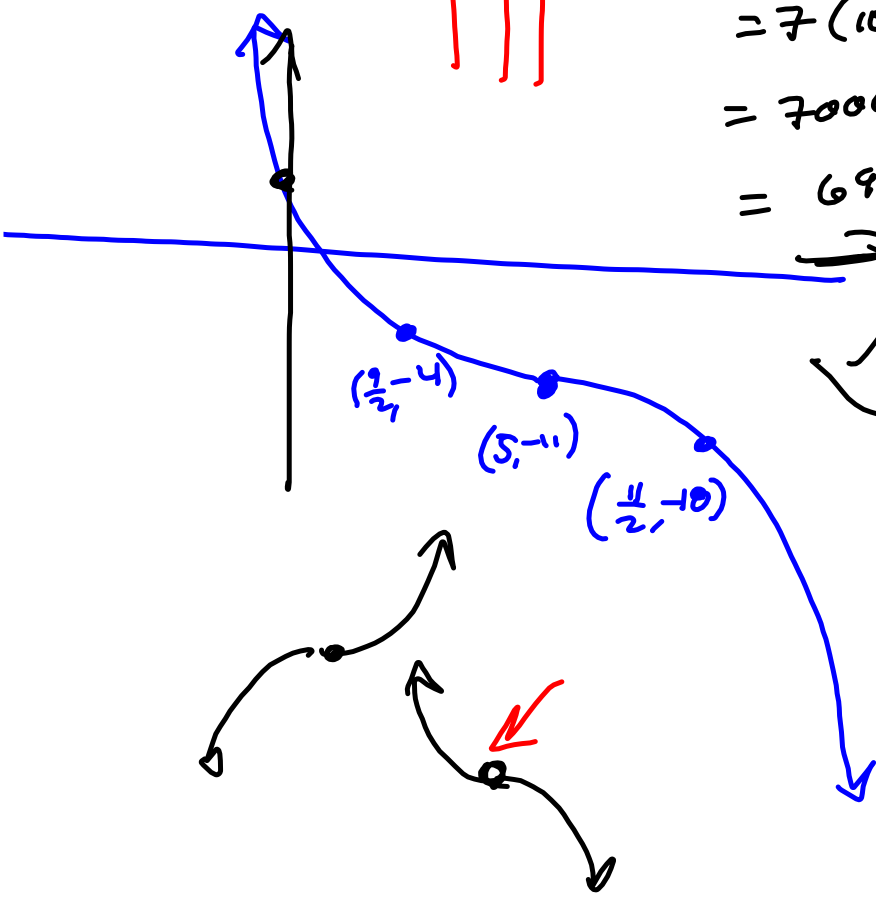
$g(0) = 7(-2(0)+10)^3 - 11$

$= 7(10)^3 - 11$

$= 7000 - 11$

$= 6989$

$\rightarrow (0, 6989)$



Take-Home Test 3 will be posted in the next few days.