**Was asked about the Chapter 1 Quiz. "Is there a Practice Quiz?"**

**Week 3 Written Assignment is Now Available.**

**Recall, Phoenix's question about 1.7 #19:**

(a) For the limit $\lim\limits_{x \to 1} (x^3 + x + 4) = 6$, use a graph to find a value of $\delta$ that corresponds to $\varepsilon = 0.3$. (Round your answer down to three decimal places.)

$\delta = \boxed{0.071}$ ✔   🔑 $\boxed{0.071}$

(b) By solving the cubic equation $x^3 + x + 4 = 6 + \varepsilon$, find the largest possible value of $\delta$ that works for any given $\varepsilon > 0$.

$\delta(\varepsilon) =$     *Looks a lot like my wolfram Alpha*

$$\frac{\sqrt[3]{\sqrt{3}\sqrt{27\varepsilon^2 + 108\varepsilon + 112} + 9\varepsilon + 18}}{\sqrt[3]{2}\,3^{\frac{2}{3}}} - \frac{\sqrt[3]{\frac{2}{3}}}{\sqrt[3]{\sqrt{3}\sqrt{27\varepsilon^2 + 108\varepsilon + 112} + 9\varepsilon + 18}}$$

✖   $$\frac{(216 + 108\epsilon + 12\sqrt{336 + 324\epsilon + 81\epsilon^2})^{2/3} - 12}{6(216 + 108\epsilon + 12\sqrt{336 + 324\epsilon + 81\epsilon^2})^{1/3}} - 1$$

(c) Put $\varepsilon = 0.3$ in your answer to part (b). (Round your answer down to three decimal places.)

$\delta(0.3) = \boxed{0.071}$ ✔   🔑 $\boxed{0.071}$



*Smaller*

$y = 6.3$    $(1.07112, 6.3)$   $\boxed{\delta_2 \approx .071}$

$(1, 6)$   (from 1.07112 − 1)

$y = 5.7$

$(.92037, 5.7)$

1.07112     $1 - .92037 = \boxed{.07963 \approx \delta_1}$

0.07963     *Bigger*

$y = x^3 + x + 4$
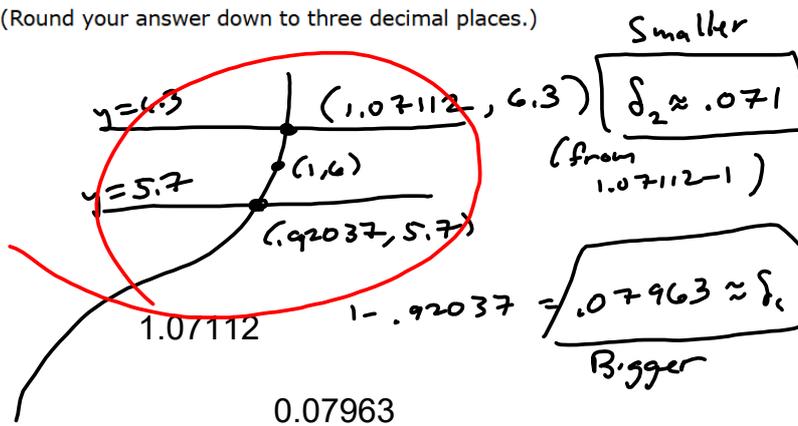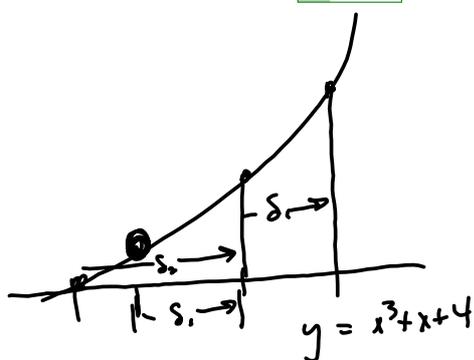
$\boxed{\text{Always take the smaller } \delta.}$

*I made part b worth 0 points*

<u>NONE</u> *of us could get part b.*

*Part c, you kinda just use part 2 & they're the same.*

**I did it with Desmos:**

$y = x^3 + x + 4$

$(1.07112, 6.3)$

$y = 6.3$     $\delta_1 = 1.07112... - 1$

$y = 5.7$     $\delta_2 = 1 - .92037...$

$(0.92037, 5.7)$

-6
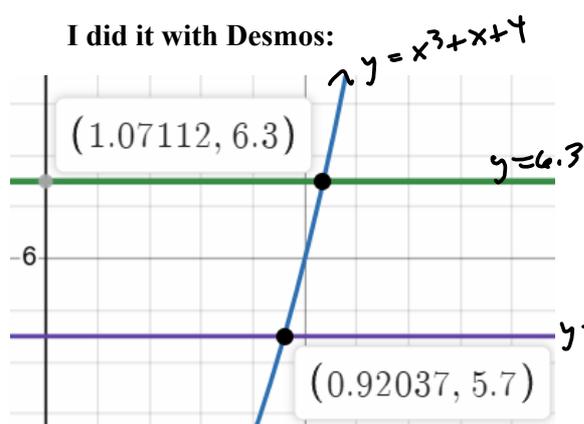
$f(x) = x^3 + x + 4$     ✕

$y = 6 + 0.3|$     ✕

$= 6.3$

$y = 6 - 0.3$     ✕

$= 5.7$

$1 - .92037$     ✕

$= 0.07963$