Name: Solutions Quiz 11

1. (9 points) Let $f(x) = x^3 + 3x^2$. Find all points that satisfy the conclusion of the Mean Value Theorem on the interval [-5,1].

2. (1 point) Sketch a rectangular solid with length $l$, width $w$, and height $h$, all in feet. Write the formulas for volume and surface area of the solid, and make sure to include the units/dimension, e.g. square feet or cubic feet.

(1) MVT says there is at least one point $x$ in $(-5,1)$ where $f'(x) = \frac{f(1)-f(-5)}{1-(-5)}$.

$f'(x) = 3x^2 + 6x$ $\qquad \frac{f(1)-f(-5)}{6} = \frac{1+3-(-125+75)}{6}$

$= \frac{4-(-50)}{6} = \frac{54}{6} = 9$

Set $3x^2+6x = 9$

$3x^2+6x-9 = 0$

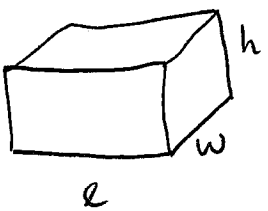
$3(x+2x-3) = 0$

$3(x-1)(x+3)=0 \Rightarrow x = 1, -3$

Note $x=1$ is not in the open interval $(-5,1)$

So our answer is the pt $x=1$.

(2)




Vol = $l \cdot w \cdot h$ $ft^3$

SA = $2lh + 2lw + 2wh$ $ft^2$