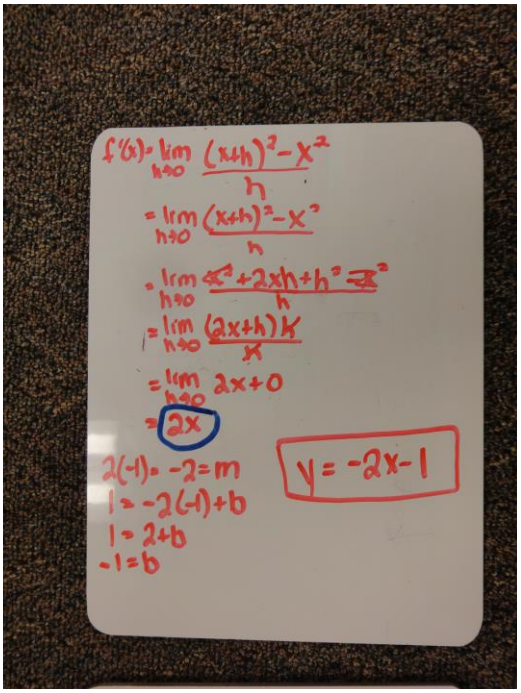
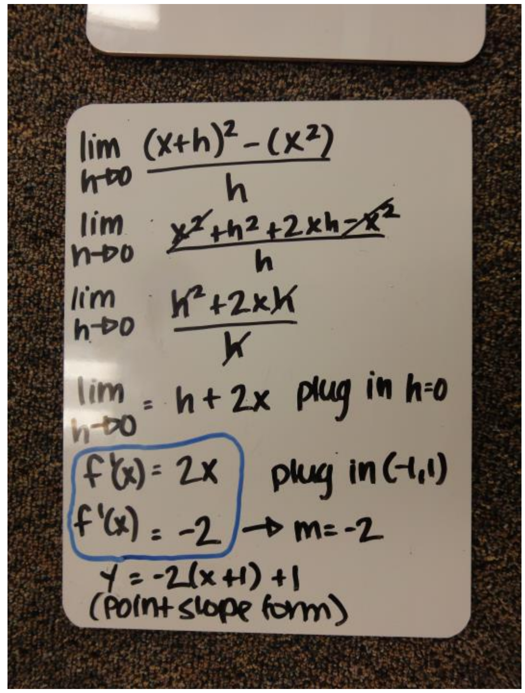
Finding the equation of a tangent line at a point on a graph…. Important takeaway: **The derivative here is a function in its own right** (dependent on *x*). Translation: the slope changes along with the *x* value selected (this would be the case for most interesting functions).





Picture at above right: Yes, $f'(x)=2x$ and then when we choose $x=-1$, we can write $f'(-1)=2\cdot(-1)=-2$. This, again, emphasizes derivative as function.

Examining $f(x)=\sqrt{x}$. Similar to the above example, the derivative is a new function, $f'(x)=\frac{1}{2\sqrt{x}}$. Note the interpretation of $f'(0)$ (a slope that can't be calculated since the tangent line is infinitely steep).