Honors Analysis Name _____

Copy the original problem.
Convince *me* that **you** understand the concept. Per _____ Date _____

C H A P T E R # 4 Mechanical

I Find and identify the *coordinates* of all extrema for each of the following. Do NOT draw the graph of the function. Each extrema must be labeled as "relative" or "absolute" in addition to Maximum or Minimum. Remember that end points yield extrema **and** that you *must justify* (explain how you know) they are what you say they are. (20 pts ea)

a) $A(x) = 2x^3 - 3x^2 - 12x + 13$ $\quad x \in [-2,\ 3]$

b) $B(x) = -\cos x$ $\quad x \in \left[\frac{-\pi}{2},\ \frac{11\pi}{6}\right]$

c) $C(x) = (a + x)\sqrt{a^2 - x^2}$ "a" is a positive constant
(hint: What are the domain restrictions on the function?)

II Given: $x^3 + 3xy + y^3 = 1$ (20 pts)

Find the equation of the line tangent to the curve at $(2, -1)$

III Given $f(x)$, determine $f'(x)$. Do not simplify your answers. (for example, leave negative exponents exponents.) Basically, I am looking for evidence that you have used the proper formula at the proper time. (10 pts ea)

a) $\dfrac{(2x+1)^3(4-x^2)^4}{(8x^3-3)^2}$

b) $\left((3x-2)^{\frac{2}{3}}(4-x)^{\frac{1}{3}}\right)\sqrt{3x^3-1}$

Extra Credit **5 pts**

Determine the *coordinates* of all points of inflection for the functions given in Section I a and I b. Show appropriate number lines as justification.