Hi, I need all of the following answered correctly and all working shown. The are a total of 15 questions including A and B's etc. There are 2 graph questions, which I'll also need a copy of the graph, but hopefully that's not too hard. This test is based of NZ's High school NCEA level 3.
I don't mind where you out the working and answers, but if you use this page please just put the working and answers in Blue or something. Thanks =)

Θ = Theta

1) Find $\frac{dy}{dx}$ for each of the following. You do not need to simplify your answers.

a) $y = \log_e 3x + 8x^3$

b) $y = \sqrt[3]{2x-1}$ (The square root sign is meant to be over the entire 2x-1)

c) $y = e^x \operatorname{cosec} x$

d) $\frac{e^{4x+3}}{4x+3}$

2) If $g(x) = 7x^3 - 2x^2 + 4x - 8$ find the third derivative $g'''(x)$

3) If $x = \sin\theta$ and $y = \sec\theta$, find $\frac{dy}{dx}$ in terms of sin θ and cos θ

4) A curve is defined by the parametric equations $x=t^2$ and $y = 2t + 1$
Find the equation of the tangent at the point where $t = 2$

5) The height in metres of a bullet fired up into the after *t* seconds is given by
$h= 2000t - 200t^2$

Find the maximum height the bullet reaches. (A test to check you have found the maximum height is expected.)

6) Nico's bubble blowing machine blows spherical bubbles whose surface area, S, increases at the rate of $25\text{cm}^2/\text{s}$.
What is the rate of increase of the radius, r, of the bubble when the radius is 5cm?

7) $f(x) = x^3 - 3x + 2$

a) Find the coordinates of any local minimum point, maximum point or point of inflection. Make sure you apply and appropriate test for each.

b) Use the factor theorem to help you find the intercepts with the axes.

c) Sketch the graph of f(x) showing the above features.

d) Give the values of x for which the graph is concave down.

8) A pile of sand is a roughly conical pile. The slant edge of the pile is 6.0m.

a) What is the height of the pile when the Volume of sand in it is at it's maximum

b) A truck operator contracted to shift the sand wants to know how many cubic metres there are. What answer should he be given? Justify your answer with a reference to the situation described