STUDENT NAME:

Calculus 1550, section 6. Tuesday March 2, 2004. Ninth quiz

1. [3 points] What is the slope of the tangent to

$$y = \sqrt{x^3} + x^3 + 3 \quad = \quad x^{3/2} + x^3 + 3$$

at the point $(0, 3)$?

$$y' = 3/2\, x^{1/2} + 3x^2$$

at $x = 0$, $y' = 3/2 \times 0 + 0 = 0$

So slope of tangent at (0,3) is $\boxed{0}$

2. [3 points] Find the derivative of the following function

$$f(x) = e^x + e^3 + x^2 + 3^2$$

$$f'(x) = e^x + 0 + 2x + 0$$

$$= \boxed{e^x + 2x}$$

(note, e^3 and $3^2 = 9$ are just constants, so have zero derivative)

3. [4 points] What is the equation for the tangent to

$$y = x^4 + x^3 + x^2 + x + 1$$

at the point $(1, 5)$?

$$y' = 4x^3 + 3x^2 + 2x + 1$$

at $x = 1$, $y' = 4 + 3 + 2 + 1 = 10$

So tangent at (1,5) is $\frac{y-5}{x-1} = 10 \Rightarrow y - 5 = 10x - 10$

$$\boxed{y = 10x - 5}$$