MATH 108 – QUIZ 5 – 1 OCTOBER 1998

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.

1. (4 pts.) With $f(x) = x^2 + x$, write down the quotient $\dfrac{f(1+h) - f(1)}{h}$ and simplify as much as possible.

2. (3 pts.) Find the slope of the tangent line to the graph of the function $f(x) = x^2 + 1$ at $x = 2$. (Hint: Evaluate the limit $\lim\limits_{h \to 0} \dfrac{f(2+h) - f(2)}{h} = \lim\limits_{h \to 0} \dfrac{(2+h)^2 + 1 - ((2)^2 + 1)}{h}$.)

3. (3 pts.) If the profit generated by setting the price of a certain product at x dollars is $P(x) = -x^2 + 400x + 2000$, find the price at which profit is maximized. (Hint: The derivative of P is $P'(x) = -2x + 400$.)