MATH 160 TH Quiz 4, Spring 2002

Name:

5. Use the rules of differentiation to find the derivatives of the following functions:

(a). $f(x) = 3x^2 + x^{\frac{1}{3}} - \frac{1}{2\sqrt{x}} + 7e^2$

(b). $y = \frac{x+1}{x-1} + 2x^3$

(c). $f(p) = p^2(1 + \ln p)$

(d). $y = e^{(x^2-3x+1)}$

6. (a). If $y = (x^2 + 3x + 1)^3$ find $\left.\frac{dy}{dx}\right|_{x=-1}$

6. (b). Find the equation of the line tangent to the graph of $y = x2^x + 1$ at $x = 0$.

7. The population of a country after t years since 1990 is approximated by $P(t) = 11(.997)^t$ million.

(a) What was the population of that country in 1990?

(b) What was the rate of change of the population at the end of the year 2000? What is the sign of the rate of change that you have computed? How do you interpret it?

8. Let $f(x) = x^3 - 3x$.

(a). Find $f'(x)$ and use it to determine the intervals over which *f(x)* is decreasing. (exact numbers required.)

(b). Find $f''(x)$ and use it to determine the intervals over which *f(x)* concave down.

9. The cost (in dollars) of producing q items is given by $C(q) = .08q^3 + 75q + 1000$.

(a) Find the marginal cost function.

(b) Find $C(50)$ and $C'(50)$. Give units with your answers.