

Math 167 CH 3 Sample Test
Show your work to receive full credit.

Name _____

I. Find the derivative of the following. Simplify the answers.

1. $f(x) = x^4 + 3x^2 - 5$

2. $f(x) = \frac{1}{x^4} + 6\sqrt{x} - 5x$

3. $f(x) = (2x^3 + 5)^5$

4. $f(x) = \frac{6x}{4x - 3}$

5. $f(x) = x^2(x^2 - 1)^3$

6. Find the second derivative: $f(x) = (x^3 + x + 1)^2$

II. Find dy/dx by implicit differentiation for $x^2 + y^2 + x^2y^2 = 10$

III. Given $f(x) = \sqrt{25 - x^2}$

1. Find $f(3)$ and $f'(3)$ and explain what each indicates.
2. Find the equation of the line tangent to $f(x)$ when $x = 3$.

IV. At Golfbid.net the monthly demand for a set of "Tiger Woods" is given by the function

$$p = 2000 - 0.4x \quad (0 \leq x \leq 4000)$$

where p denotes the unit price in dollars and x denotes the quantity demanded. The monthly cost for manufacturing the sets is given by

$$C(x) = 0.02x^2 + 10x + 12,000$$

1. Find the revenue function R , the profit function P , and the average cost \bar{C}
2. Find $P(3000)$ and $\bar{C}(3000)$ and explain what they indicate.
3. Compute the marginal profit and marginal cost when 3000 sets are produced. Explain what that each indicates.