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 \( x^2 + y^2 + x^2 y^2 = 10 \)

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 each indicates.