

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 1) If $f(x, y) = 4x^3y^2 + 3x^2y^4 - 7xy^2 + 4x - 3y + 2$, find (a) $f_x(x, y)$ and (b) $f_y(x, y)$. 1) _____
- 2) Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ where $f(x, y) = x^3e^{2y} + y^2 \ln 3x$ and evaluate both derivatives at $(1, 0)$. 2) _____
- 3) Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ where $f(x, y) = \frac{5xy^2}{(x^3 + y^3)}$. 3) _____
- 4) Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ where $f(x, y, z) = \frac{4y^3}{x^3 + y^2}$. 4) _____
- 5) If $f(x, y, z) = x^2\sqrt{y^2 + z}$, find (a) $f_x(x, y, z)$, (b) $f_y(x, y, z)$, and (c) $f_z(x, y, z)$. 5) _____
- 6) If $f(x, y, z) = x^2yz^2 + xy^2z + xy$, then $f_x(1, 2, 3) =$ 6) _____
- 7) If $z = e^{x/y}$, then $\frac{\partial z}{\partial y} =$ 7) _____
- 8) A sporting goods store determines that the optimal quantity of athletic shoes (in pairs) to order each month is given by the Wilson lot size formula: $Q(C, M, s) = \sqrt{\frac{2CM}{s}}$, where C is the cost (in dollars) of placing an order, M is the number of pairs sold each month, and s is the monthly storage cost (in dollars) per pair of shoes. Find $\frac{\partial Q}{\partial C}$. Then find and interpret $\left. \frac{\partial Q}{\partial C} \right|_{(100, 500, 3)}$. 8) _____
- 9) A company manufactures two products, X and Y , and the joint-cost function for these products is given by $c = 0.002(x + y)^2 + x + 0.25y + 8000$, where c is the total cost of producing x units of X and y units of Y . Determine the marginal cost with respect to x when $x = 450$ and $y = 550$. 9) _____
- 10) A company's production function is given by $P = 2.1L^{0.6}k^{0.4}$, where P is the total output generated by L units of labor and k units of capital. Determine:
 - (a) the marginal production function with respect to L
 - (b) the marginal production function with respect to k
 10) _____