

KANSAS STATE UNIVERSITY
Economic Analysis for Business

Problem Set 1
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Economics 815
Spring 2003

1. Graph the functions.
 - a. $y = -2x + 4$
 - b. $y = 3x + 1$
 - c. $y = 2/x$
 - d. $y = x^2 + 4$
 - e. $y = 16x - x^2$
 - f. $y = 4x - 1/x^2$
2. Find the inverses of the functions in 1.a. through 1.d.
3. Find the first and second derivative for each function in 1.a. through 1.f.
4. Find the first and second derivative for the following functions.
 - a. $y = 10 + 2x + 5x^2 - 4x^3$
 - b. $y = (5 - 3x)^4$ (Use chain rule.)
 - c. $y = 12x^3(6x - 2)^5$ (Use the product rule and the chain rule.)
 - d. $y = (x^2 + 5)/x^3$ (Use the quotient rule.)
5. Find the first, second, and cross partial derivatives for each of the following functions.
 - a. $z = 3x^2 + 15y^2 - x - 3y$
 - b. $z = x^3y^4$
 - c. $z = (x + y)/xy$
6. The equilibrium price and quantity in a market are given by $P = 6$ and $Q = 24$.
 - a. Find the equation of the linear demand curve if the price elasticity is equal to -2 at the market equilibrium.
 - b. Find the equation of the linear supply curve if 36 units of the good are supplied at a price of 12.
7. The quantity demanded is 16 when the market price is 4. The consumers' surplus generated in this market at this price and quantity is 64. What is the equation of the linear inverse demand curve, $P(Q) = a - bQ$, consistent with this information?
8. Suppose that a 5 percent increase in price results in a 10 percent decrease in quantity demanded. What is the implied price elasticity of demand? How should price be changed, if at all, to maximize revenue?

