Related Rates Name:________________________________

Math 150 (section 2.7)

Implicit Differentiation:

1) Suppose the VeeCam Company determines that the price-demand equation for their economy tripod is given by: $p+2xp+x^2=125$ where x represents the demand for tripods in thousands and p represents the price in dollars. Determine $\frac{dp}{dx}$. Evaluate and interpret dp/dx at (2.5,19.5).

Related Rates:

2) Past records of the TechTop Company determine that the revenue for the number of software suites produced and sold is given by: $R=90x-x^2$, where x is the units produced and sold and R is the revenue in dollars. The company also finds that the software is selling at a rate of 5 suites per day. How fast is the revenue changing when 40 suites are being produced and sold?

3) The SoftSkirt Company determines that the monthly revenue for a new style skirt is given by: $R=60-\frac{1}{2}x^2$, where x is the number of skirts produced and sold in hundreds, and R is the revenue in thousands of dollars. Determine the rate of change in the revenue with respect to time at a production level of x = 3 and production increasing by 20 hundred skirts per month.

4) When the price of a certain commodity is p dollars per unit, the manufacturer is willing to supply x thousand units where, $x^2-2x\sqrt{p}-p^2=31$ How fast is the supply changing when the price is $9 per unit and is increasing at the rate of 20 cents per week?

5) When the price of a certain commodity is p dollars per unit, consumers demand x hundred units where $75x^2+17p^2=5300$. How fast is the demand changing with respect to time when the price is $7 and is decreasing at a rate of 75 cents per month.

Answers:

1) $\frac{dp}{dx} = \frac{-2x - 2p}{1 + 2x}$, when the demand is 2.5 thousand tripods and the price is \$19.50, the price is decreasing at a rate of \$7.33 per thousand tripods

2) Revenue is increasing at a rate of \$50/day, when 40 suites are produced and sold.

3) When 300 skirts are sold and increasing by 2000/month, the revenue is decreasing at a rate of \$60,000/month,

4) The supply is increasing at a rate of 206 units/week (you must use x =14)

5) The demand is increasing approx 15 units/month (use dp/dt = -0.75)