

- 1) Write an equation for a cost function where the fixed costs are \$2200 and the variable costs are \$10 per unit.

$$C(x) = 10x + 2200$$

- 2) Suppose that the cost, in dollars, for a company to produce x pairs of a new line of jeans is $C(x) = 2100 + 4x + 0.03x^2 + 0.0001x^3$.

- (a) Find the marginal cost function. $C'(x) = 4 + 0.06x + 0.0003x^2$

(b) Find $C'(100) = 4 + 0.06(100) + 0.0003(100)^2 = \frac{813}{\text{pair of jeans}}$

What does the $C'(100)$ predict?

- A) The exact cost of the 101st pair of jeans
- B) The exact cost of the 100th pair of jeans.
- C) The exact cost of the 99th pair of jeans.
- D) The approximate cost of the 101st pair of jeans.
- E) The approximate cost of the 100th pair of jeans.

- 3) A manufacturer of power supplies estimates that it will incur a total cost of $C(q) = 2600 + 3q + 0.003q^2$ dollars when producing q power supplies, and it will collect $R(q) = 16q - 0.005q^2$ dollars in revenue.

- (a) Write a function for the profit P the manufacturer can expect after producing q power supplies.

$$P(q) = R(q) - C(q) = (16q - 0.005q^2) - (2600 + 3q + 0.003q^2)$$

$$P(q) = -0.008q^2 + 13q - 2600$$

- (b) Find the marginal cost function.

$$C'(q) = 3 + 0.006q$$

- (c) Find the marginal revenue function.

$$R'(q) = 16 - 0.01q$$

- (d) How many power supplies should the manufacturer produce in order to maximize profit?

Solve for q value of vertex of $P(q) = -0.008q^2 + 13q - 2600$

which should be $q = \frac{-13}{2(-0.008)} = 812.5$ Power supplies
 ≈ 813 Power supplies