Profit Maximization

Slide 1: Profits

Profits (π) = Total Revenues (TR) - Total Costs (TC)

Slide 2: Profit Function

$\mathsf{TR} = f(\mathsf{Q})$

$\mathsf{TC} = g(\mathsf{Q})$

$\pi = \mathsf{TR} - \mathsf{TC} = f(\mathsf{Q}) - g(\mathsf{Q})$

 $\ensuremath{\mathbb C}$ Council for Economic Education

Slide 3: Total Revenue Function

$TR = P \times Q$

Suppose P = 10 - Q

Substituting (10 - Q) for P, TR = (10 - Q) x Q = $10Q - Q^2$

 $\ensuremath{\mathbb C}$ Council for Economic Education



Slide 5: Constructing the Profit Function

$\pi = TR - TC$

$= 10Q - Q^{2} - (2Q^{3} - 4Q^{2} + 4Q + 4)$ TR TC $= -2Q^{3} + 3Q^{2} + 6Q - 4$

Slide 6: Determining the Critical Value

$$\pi'(Q) = -6Q^2 + 6Q + 6$$

Setting $\pi'(Q) = 0$,
 $-6Q^2 + 6Q + 6 = 0$

Solving for Q using the quadratic formula, $Q = [-6^{+} (6^{2} - 4^{*} - 6^{*} - 6^{1/2})] / 2^{*} - 6$ = -0.618 or 1.618Since Q ≥ 0, Q = 1.618

Slide 7: Calculating Profit $\pi = -2Q^3 + 3Q^2 + 6Q - 4$ If Q=1.618, $\pi = -2(1.618)^3 + 3(1.618)^2 + 6(1.618) -$ = 5.09

 $\ensuremath{\mathbb{C}}$ Council for Economic Education

Slide 8: Profit Function Graph

