Mathematical Analysis of Equilibrium

$$Q = q + q + q$$

Agenda

- The previous two lectures worked with graphical and tabular cost functions.
- Now we turn to mathematical cost functions.

Three Firms

$C = 10 + 3q + 2q^2$

$C = 5 + 4q + q^2$

$C = 10 + 16q + 4q^2$

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$C = 10 + 3q + 2q^2$

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$C = 10 + 16q + 4q^2$

$MC = 3 + 6q$

$MC = 4 + 2q$

$MC = 16 + 8q$

Three Firms

$MC = 3 + 6q = P$

$MC = 4 + 2q = P$

$MC = 16 + 8q = P$

$q = (p-3)/6$

$q = (p-4)/2$

$q = (p-16)/8$

Three Firms

$q = (p-3)/6$

$q = (p-4)/2$

$q = (p-16)/8$

Warning: these equations are valid only if $p > AC_{min}$

Recall the Process

$C = 10 + 3q + 2q^2$

$MC = 3 + 6q$

$3 + 6q = 10/q + 3 + 2q$

$4q^2 = 10$

$$q = \sqrt{2.5}$$

The Supply Function

$q = (p-3)/6$

$q = (p-4)/2$

$q = (p-16)/8$

The Supply Function

$q = (p-3)/6$

$q = (p-4)/2$

$q = (p-16)/8$

$Q = q + q + q =$

$(p-3)/6 + (p-4)/2 + (p-16)/8$

$$Q = (19p-108)/24$$

End