LECTURE 10
PERFECT COMPETITION IN THE SHORT RUN

Question 1: Why *MR=MC*?

- To maximize profit, the first-order condition requires

$$MR(Q) = MC(Q)$$

- In a perfectly competitive market, it becomes

$$P = MC(Q)$$

- What is the intuition?
- If *P<MC*, what does it mean and what should the firm do?

Question 1: Solution

- Suppose market price is P=12
- MR=P=12
  - If the firm decreases the production level, the total revenue decreases at a rate of 12
- Suppose at the current production level, SMC=16
  - If the firm decreases the production level, the total cost decreases at a rate of 16
- When $P<SMC$, total revenue decreases slower than total cost as production level decreases
  - Similarly, total revenue increases slower than total cost when Q increases

Question 1: Comment

- Suppose the market price is still P=12
- MR=P=12
  - If the firm increases the production level, the total revenue increases at a rate of 12
- Suppose at the current production level, SMC=4
  - If the firm increases the production level, the total cost increases at a rate of 4
- When P>SMC, total revenue increases faster than total cost as production level increases

Question 1: Comment

- When *P>SMC*
  - Firm should produce more
- When *P<SMC*
  - Firm should produce less
- If the firm can increase the profit by either producing more when *P>SMC* or producing less when *P<SMC*
- It must be that the firm is maximizing profit when producing an output level such that *P=SMC*

Question 2: *SMC* vs. *ANSC* vs. *SAC*

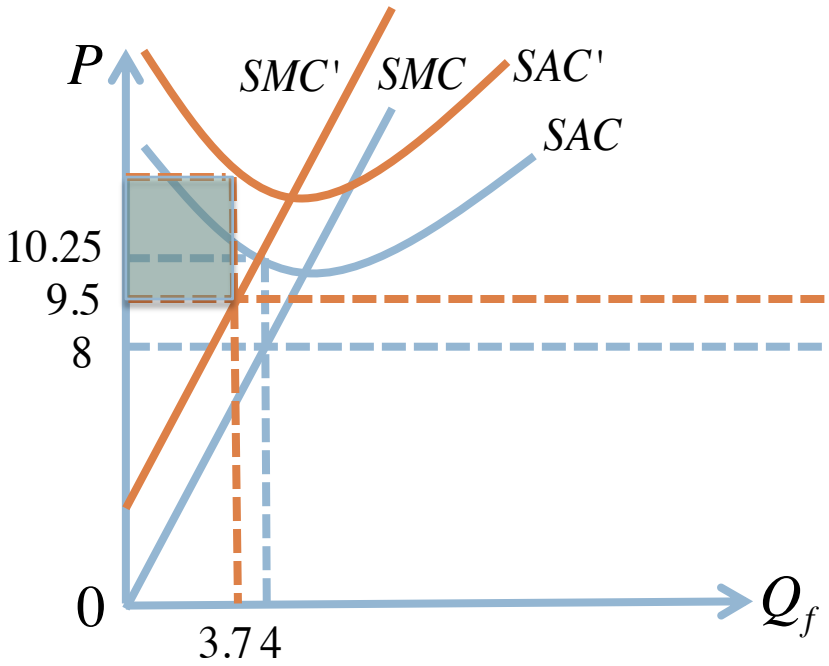
- When to use which?
- To decide whether to produce or not, the firm should use
  - *ANSC*
  - Firm only produces when *P*>=min(*ANSC*)
- If the firm produces, to decide how much to produce, the firm should use
  - *SMC*
  - Firm should produce at where *P*=*SMC* and *SMC* is not downward sloping
- To see whether the firm is making profit, the firm should use
  - *SAC*
  - If *P*>*SAC*, firm is making profit

Question 3: Comparative Statics of Short-Run Equilibrium

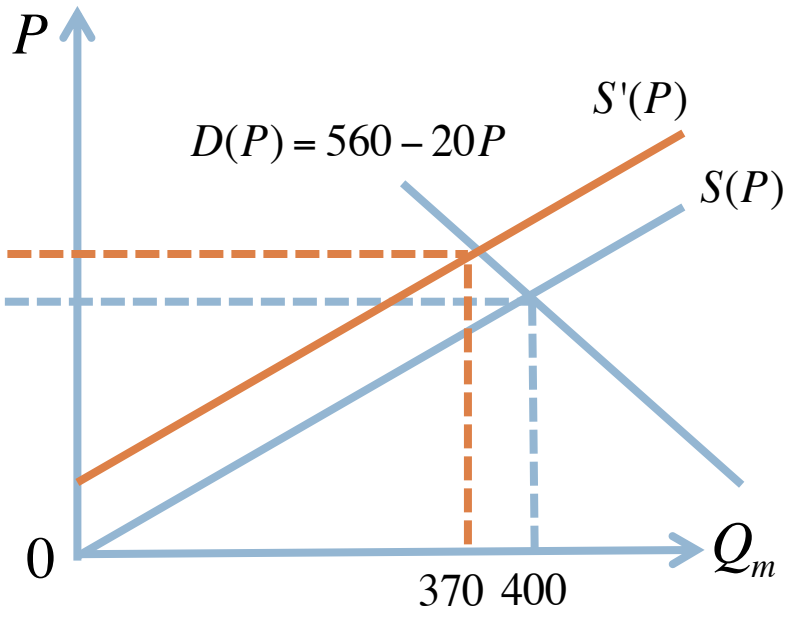
- Suppose a market has reached the short-run equilibrium
- We have seen what would happen in the market when demand increases
- What if input prices change?
- Suppose the price of labor increases
  - Which curves will change and which will not?

Question 3: Solution

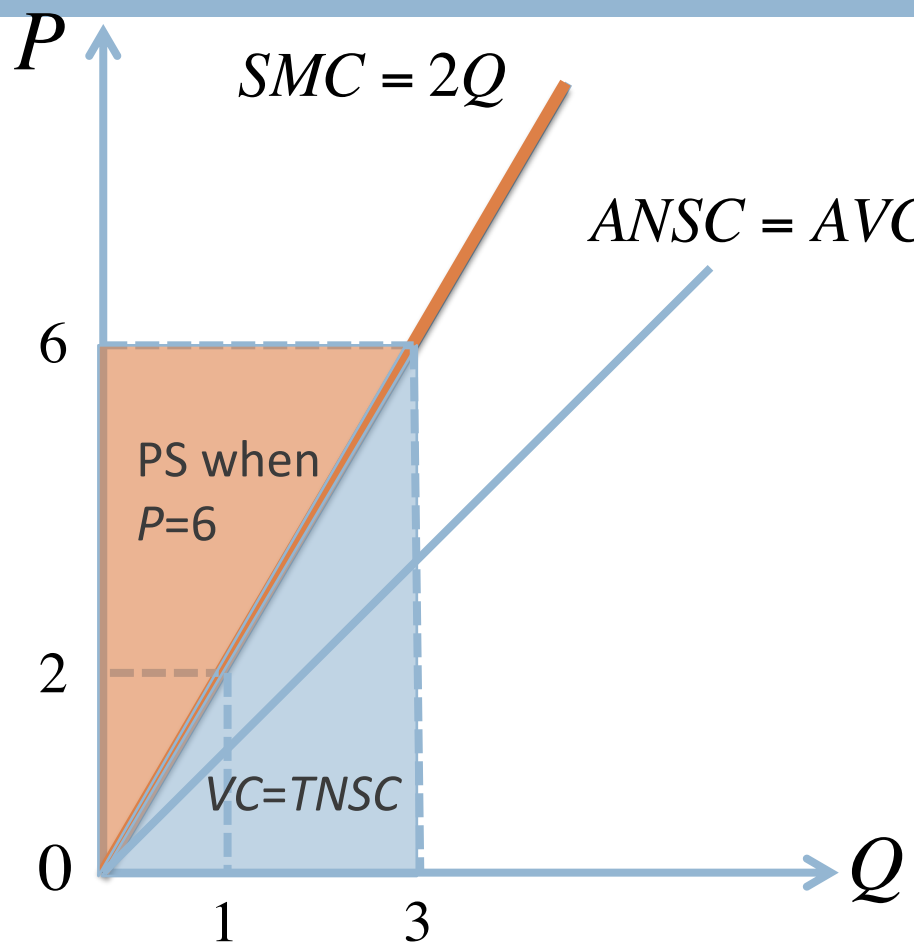
Typical Firm's Cost and Supply



Market Equilibrium with 100 Identical Firms



Question 4: Producer Surplus



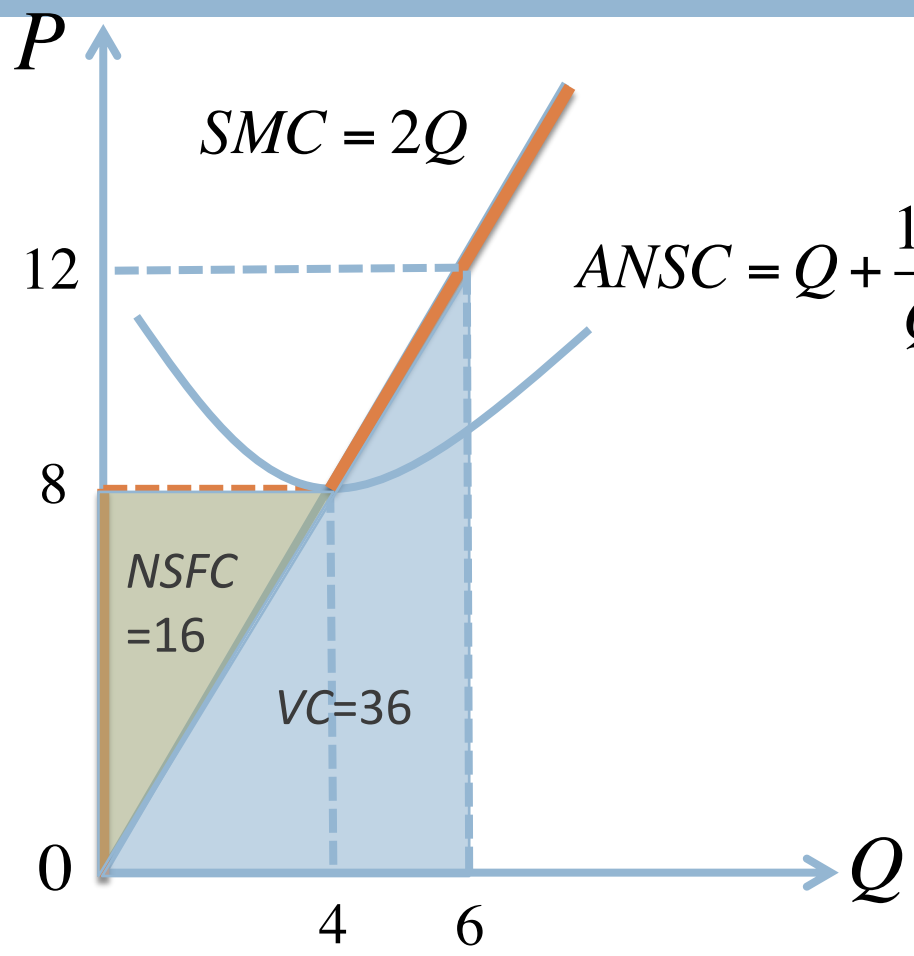
$$STC(Q) = Q^2 + 25$$

All fixed cost is sunk

Supply curve is $Q=P/2$

Suppose the price is 6, what is the shaded area?

Question 4: Producer Surplus Cont'



$STC(Q) = Q^2 + 25$

Suppose the non-sunk fixed cost is 16

Suppose the price is 12, calculate *VC* and *NSFC*

Q&A on Lecture 10