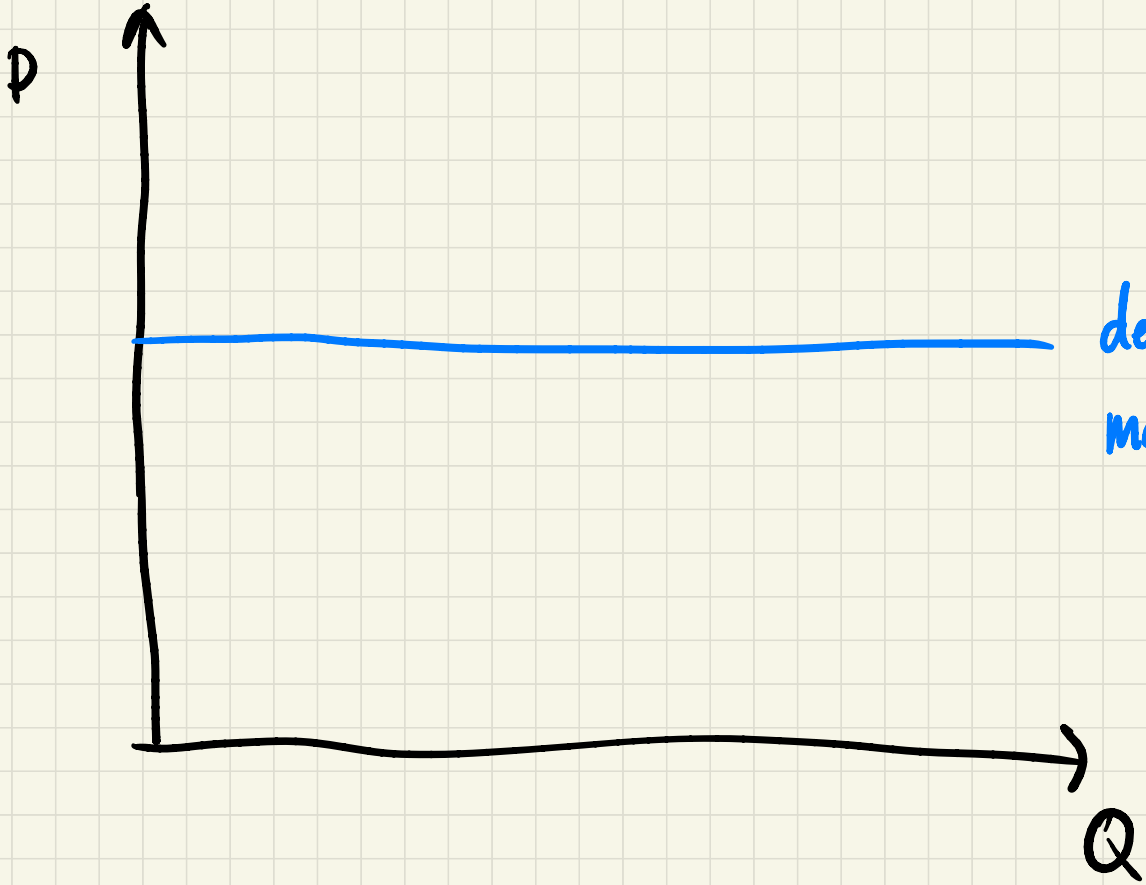


Lecture 11: In-class problems
EVENING

11/10/2020



demand curve /
marginal revenue.
= p

Q1)

8. Hack's Berries faces a short-run total cost of production given by $TC = Q^3 - 12Q^2 + 100Q + 1,000$, where Q is the number of crates of berries produced per day. Hack's marginal cost of producing berries is $3Q^2 - 24Q + 100$.

a. What is the level of Hack's fixed cost?

the part that
does not
depend on Q

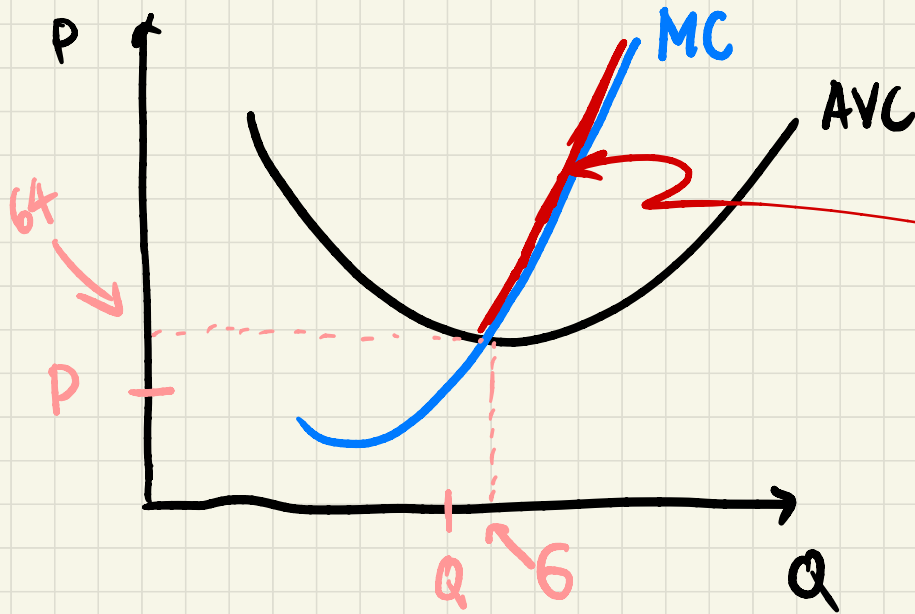
Q1)

b. What is Hack's short-run average variable cost of producing berries?

$$AVC = \frac{VC}{Q} = \frac{Q^3 - 12Q^2 + 100Q}{Q} = Q^2 - 12Q + 100$$

Q1)

- c. If berries sell for \$60 per crate, how many berries should Hack produce? How do you know? (Hint: You may want to remember the relationship between MC and AVC when AVC is at its minimum.)



firm's short supply curve

what does a firm equate to maximize profit?

$$MC = MR$$

in a perfectly comp. market, $MR = P$ for all firms

⇒ in a perf. comp mkt

MR = MC
P = MC }
for all firms

for firms in a
perf. comp mkt ONLY

First, figure out firm's supply curve

MC where $MC > AVC$

Solve for $MC = AVC$

$$3Q^2 - 24Q + 100 = Q^2 - 12Q + 100$$

$$3Q^2 = Q^2 + 12Q$$

$$\frac{2Q^2 = 12Q}{Q}$$

Q

$$2Q = 12$$

$$Q = 6$$

Find P where $MC = AVC$

$$Q^2 - 12Q + 100$$

$$= 6^2 - 12(6) + 100$$

$$= 64$$

At a price of \$60,
the firm does not
want to produce

Q1)

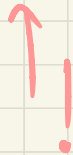
d. If the price of berries is \$79 per crate, how many berries should Hack produce? Explain.

Plug $P = 79$ into MC

$$3Q^2 - 24Q + 100 = 79.$$

then the answer involves the quad. eqn.

$$Q = \{1, 7\}$$



Q2)

13. Five hundred small almond growers operate areas with plentiful rainfall. The marginal cost of producing almonds in these locations is given by $MC = 0.02Q$, where Q is the number of crates produced in a growing season. Three hundred almond growers operate in drier areas where costly irrigation is required. The marginal cost of growing almonds in these locations is given by $MC = 0.04Q$.

- a. Find the individual supply curve for each type of almond grower. (*Hint: Remember that the supply relationship expresses the quantity brought to market at various prices. Remember also that for a perfectly competitive firm, $P = MR$.*)

Q2)

b. "Add up" the individual supply curves to derive the market supply curve.

(Q2)

c. If the market demand for almonds is $Q^D = 105,000 - 2,500P$, what will the equilibrium price of almonds be? The equilibrium quantity?