

Practice Quiz on Chapter 8

True-False Questions

1. The short-run industry supply curve is the industry supply curve obtained when fixed costs cannot be changed and the number of firms in the industry is also unchanged.

Answer: True

Fixed costs are costs associated with factors that cannot be changed in the short run. And the number of firms is also fixed in the short-run.

2. When an industry is in long-run competitive equilibrium, price must be equal to variable cost.

Answer: False

Multiple Choice Questions

In the long run, price must cover all costs, fixed and variable. If not, firms will exit from the industry.

3. Demand for haircuts in the city of San Barberia is given by the function $P=39-Q/20$, where Q is the number of haircuts per day and P is the price of a haircut. Everyone who opens a barber shop in town has a fixed cost of \$200 per day which must be paid so long as a shop is in business and regardless of the number of haircuts it sells. There is also a variable cost of \$4 for each customer served. Each barber shop has a capacity of 40 customers per day. San Barberia currently has 12 barbershops. A barber shop that is open cannot escape its fixed costs immediately, but must give 6 months notice to its landlord of its intention to close. It also takes about 6 months to organize and open a new barber shop. The short run supply curve for haircuts in San Barberia consists of

- (a) a vertical segment extending from the origin to the point $(0,4)$ and an unbounded horizontal line extending to the right of the point $(0,4)$
- (b) a vertical segment extending from the origin to the point $(0,4)$, a horizontal segment extending from $(0,4)$ to $(480,4)$, and a vertical segment extending upwards from $(480,4)$.
- (c) a vertical segment extending from the origin to the point $(0,9)$, a horizontal segment extending from $(0,9)$ to $(480,9)$, and a vertical segment extending upwards from $(480,9)$.
- (d) a vertical segment extending from the origin to the point $(0,4)$, a horizontal segment extending from $(0,4)$ to $(560,4)$ and a vertical segment extending upwards from $(560,4)$.
- (e) a vertical segment extending from the origin to the point $(0,4)$, a horizontal segment extending from $(0,4)$ to $(360,4)$, and a vertical segment extending upwards from $(360,4)$.

Answer: B

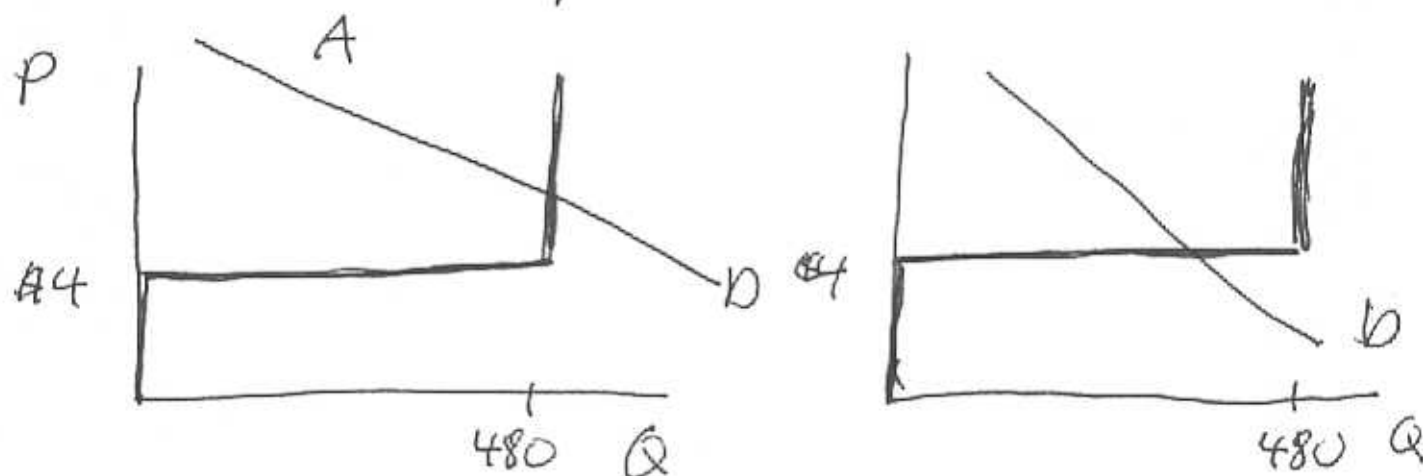
If price is less than the variable cost of \$4, barber shops would not be willing to cut anyone's hair. Thus supply would be zero. If price exceeds \$4, shops would receive more revenue than the extra cost of supplying a haircut. Thus, each would be willing to supply 40 haircuts. There are 12 barbershops, so $480 (= 12 \times 40)$ haircuts would be supplied if price is greater than \$4.

4. What is the short run equilibrium price of a haircut in San Barberia?

- (a) \$15
- (b) \$5
- (c) \$4
- (d) \$9
- (e) \$20

Answer: A

There are two possibilities: A and B



In A, price is greater than \$4 and quantity is 480. Is that possible with this demand function? Let's check it out

$$\begin{aligned}
 P &= 39 - \frac{480}{20} \\
 &= 39 - 24 \\
 &= 15
 \end{aligned}$$

OK. That's it!

Suppose you started with B. Then $P = \$4$ and quantity is less than 480. Is that possible? Check it out. $4 = 39 - \frac{Q}{20} \Rightarrow 35 = \frac{Q}{20} \Rightarrow Q = 700$. No, that's not possible.

5. If initially, conditions in San Barberia are as described in the previous questions, and if in the long run there is free entry and exit from the industry, competitive theory predicts that in the long run in San Barberia the number of barber shops

- (a) would decrease and each would sell more haircuts per day.
- (b) would decrease and each would continue to operate at full capacity.
- (c) would increase.
- (d) would remain the same, but each would sell more haircuts.
- (e) would remain the same and each would continue to operate at full capacity.

Answer: C

at full capacity, each barbershop has average total cost of \$9 — average variable cost of \$4 plus average fixed cost of \$5. Thus, if price is \$15, barbershops are making a profit of \$6 per haircut. This profit would encourage others to open barber shops.

6. Suppose that 5 new barbershops open in San Barberia and none of the old barbershops close. In the new short run equilibrium the price of a haircut

- (a) will be \$9 and all barbershops will make zero profits.
- (b) will be \$10 and all barbershops will make positive profits.
- (c) will be \$8 and all barbershops will make losses.
- (d) will be \$5 and all barbershops will make losses.
- (e) will be \$6 and all barbershops will make losses.

Answer: D

With 5 new barbershops, the total capacity to cut hair is ~~6~~ 680 ($= 40 \times 17$)

Going back to the answer to question B,⁴ we have either situation A or B. Let's check out A, where price exceeds \$4 and quantity is 680. Is that possible with this demand function? Let's see.

$$\begin{aligned} P &= 39 - \frac{680}{20} \\ &= 39 - 34 \\ &= 5. \end{aligned}$$

OK. That's it! Price is equal to \$5.

But average total cost is \$9, so all shops make losses.

7. In long run equilibrium in San Barberia, the number of barber shops

- (a) is 15 and the price of a haircut is \$9.
- (b) is 17 and the price of a haircut is \$5.
- (c) is 12 and the price of a haircut is \$15.
- (d) is 13 and the price of a haircut is \$13
- (e) is 16 and the price of a haircut is \$9.

Answer: A

In long-run equilibrium, all barber shops are making enough revenue to cover their costs and the entry of one more shop would cause everyone to make losses. To cover costs, price must be at least \$9, which is average total cost. What is demand at a price of \$9?

$$9 = 39 - \frac{Q}{20}$$

$$30 = Q/20$$

$$600 = Q$$

How many shops would be necessary to have a supply of 600? $15 (= 600/40)$

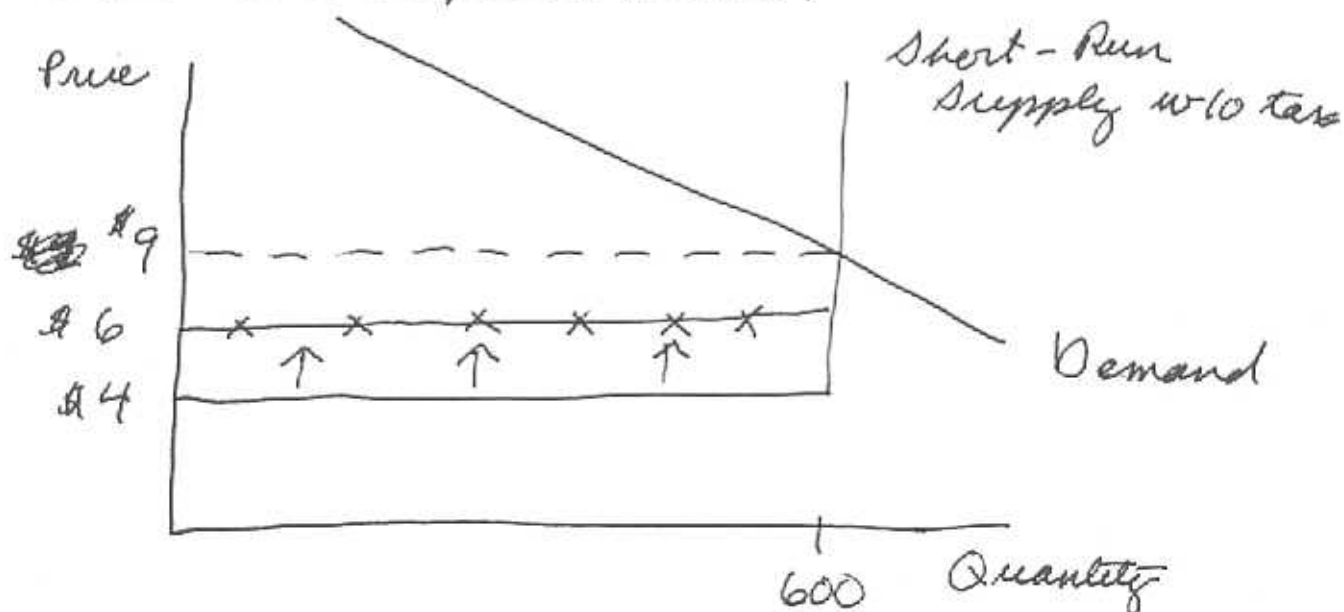
So, 15 shops and a price of \$9 is a long-run equilibrium. Every shop is exactly covering its costs, but one more shop would drive price below \$9, and they would all make losses.

8. Suppose that in San Barberia, the number of barber shops had adjusted so that both the number of barber shops and the price of a hair cut were in long run equilibrium. After long run equilibrium had been reached without any taxes, the city unexpectedly imposed a tax on barbers, requiring them to pay a \$2 sales tax on every haircuts they sold. What does economic theory predict would be the short run effect of the tax on the price of a hair cut?

- (a) The price would rise by \$2.
- (b) The price would rise by \$1.
- (c) The price would remain the same as before the tax.
- (d) The price would rise by \$.50.
- (e) The price would rise by \$1.50.

Answer: C

The demand curve and short-run supply curve are depicted below.



A tax of \$2 would shift the supply curve up by \$2. This is shown by the line with x's. The equilibrium price is still \$9.

9. How would the new \$2 tax on hair cuts affect profits of barber shops in the short run?

- (a) Because prices rise by the amount of the tax, there would be no effect.
- (b) Profits would fall, but would remain positive after the tax.
- (c) Profits would fall to zero after the tax.
- (d) In the short run, after the tax is imposed, each firm would have a loss of \$40.
- (e) In the short run, after the tax is imposed, each firm would have a loss of \$80.

Answer: E

Before the tax, each firm was breaking even. The tax would not change price or quantity in the short-run. Hence each firm's profit would decline by the amount of the tax, which is \$80 ($= 40 \times \2).

10. In long run equilibrium, imposing the \$2 tax on haircuts in San Barberia would cause the price of haircuts

- (a) to rise by \$1.50 and the number of barbershops to increase by 1.
- (b) to rise by \$1 and the number of barbershops to stay constant.
- (c) to rise by \$2 and the number of barbershops to stay constant.
- (d) to rise by \$2 and the number of barbershops to decrease by 1.
- (e) to rise by \$2 and the number of barbershops to decrease by 3.

Answer: D

With a tax of \$2, average total cost at capacity is \$11. How many haircuts would be demanded at \$11? Let's see.

$$\$11 = 39 - Q/20$$

$$28 = Q/20$$

$$560 = Q$$

How many barber shops would be necessary to supply 560 haircuts? 14 ($= 560/40$)
So if there were 14 barbershops, the price would be \$11, and each would be just breaking even. This is a long-run equilibrium because one more shop would drive the price below \$11 and they would all be losing money.