

# **Review for final exam**

**Tuesday, July 27**

## QUESTION 1 (discrete, perfect competition)

Q	TB
1	20
2	38
3	54
4	68
5	80
6	90
7	98

The consumer benefit schedule is given by the table.

If marginal cost is constant at  $MC = 9$ , and the market is perfectly competitive, then what quantity will be bought and sold in equilibrium?

A) 2

B) 3

C) 4

D) 5

E) 6

## answer to question 1

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

The consumer benefit schedule is given by the table.

If marginal cost is constant at  $MC = 9$ , and the market is perfectly competitive, then what quantity will be bought and sold in equilibrium?

A) 2

B) 3

C) 4

D) 5

E) 6

## QUESTION 2 (perfect competition)

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the market is perfectly competitive, then what is the consumer surplus in equilibrium?

A) 18

B) 36

C) 12

D) 42

E) 60

## answer to question 2

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the market is perfectly competitive, then what is the consumer surplus in equilibrium?

$$90 - 6 \times 9 = 90 - 54 = 36$$

A) 18

B) 36

C) 12

D) 42

E) 60

### QUESTION 3 (perfect competition)

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the market is perfectly competitive, then what is the producer surplus in equilibrium?

A) 4

B) 90

C) 0

D) 10

E) 36

### answer to question 3

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the market is perfectly competitive, then what is the producer surplus in equilibrium?

A) 4

B) 90

C) 0

D) 10

E) 36

## QUESTION 4 (price floor)

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the government imposes a price floor (minimum price) at  $P = 11$ , what will the quantity be in the new equilibrium?

A) 2

B) 3

C) 4

D) 5

E) 6



## answer to question 4

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the government imposes a price floor (minimum price) at  $P = 11$ , what will the quantity be in the new equilibrium?

A) 2

B) 3

C) 4

D) 5

E) 6

## QUESTION 5 (price floor)

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the government imposes a price floor (minimum price) at  $P = 11$ , how much deadweight loss will result from the price floor?

A) 10

B) 80

C) 1

D) 5

E) 45

## answer to question 5

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

If marginal cost is constant at  $MC = 9$ , and the government imposes a price floor (minimum price) at  $P = 11$ , how much deadweight loss will result from the price floor?

The 6<sup>th</sup> unit, which is not sold given the price floor, had a marginal benefit of 10, and a marginal cost of 9.

A) 10

B) 80

C) 1

D) 5

E) 45

## alternate solution

Q	TB	MB
1	20	20
2	38	18
3	54	16
4	68	14
5	80	12
6	90	10
7	98	8

**Without the price floor...**

$$P = 9, Q = 6$$

$$CS = 90 - 6 \times 9 = 36$$

$$PS = 0$$

$$TES = 36$$

**With the price floor of 11...**

$$P = 11, Q = 5$$

$$CS = 80 - 5 \times 11 = 25$$

$$PS = 11Q - 9Q = (11 - 9)5 = 10$$

$$TES = 35$$

**A) 10**

**B) 80**

**C) 1**

**D) 5**

**E) 45**

## QUESTION 6 (monopolist)

Q	TB	MB	R	MR
1	20	20		
2	38	18		
3	54	16		
4	68	14		
5	80	12		
6	90	10		
7	98	8		

Suppose that instead of perfectly competitive suppliers, there is a single monopolist, still with constant marginal cost  $MC = 9$ .

What is the monopolist's marginal revenue from the 3<sup>rd</sup> unit sold?

A) 3

B) 54

C) 16

D) 12

E) 48

## answer to question 6

Q	TB	MB	R	MR
1	20	20	20	20
2	38	18	36	16
3	54	16	48	12
4	68	14	56	8
5	80	12	60	4
6	90	10	60	0
7	98	8	56	- 4

Suppose that instead of perfectly competitive suppliers, there is a single monopolist, still with constant marginal cost  $MC = 9$ .

What is the monopolist's marginal revenue from the 3<sup>rd</sup> unit sold?

A) 3

B) 54

C) 16

D) 12

E) 48

## QUESTION 7 (monopolist)

Q	TB	MB	R	MR
1	20	20	20	20
2	38	18	36	16
3	54	16	48	12
4	68	14	56	8
5	80	12	60	4
6	90	10	60	0
7	98	8	56	- 4

Suppose that instead of perfectly competitive suppliers, there is a single monopolist, still with constant marginal cost  $MC = 9$ .

What quantity will the monopolist choose to produce, to maximize its profit?

A) 2

B) 3

C) 4

D) 5

E) 6

## answer to question 7

Q	TB	MB	R	MR
1	20	20	20	20
2	38	18	36	16
3	54	16	48	12
4	68	14	56	8
5	80	12	60	4
6	90	10	60	0
7	98	8	56	- 4

Suppose that instead of perfectly competitive suppliers, there is a single monopolist, still with constant marginal cost  $MC = 9$ .

What quantity will the monopolist choose to produce, to maximize its profit?

A) 2

B) 3

C) 4

D) 5

E) 6



## QUESTION 8 (monopolist)

Q	TB	MB	R	MR
1	20	20	20	20
2	38	18	36	16
3	54	16	48	12
4	68	14	56	8
5	80	12	60	4
6	90	10	60	0
7	98	8	56	- 4

Suppose that instead of perfectly competitive suppliers, there is a single monopolist, still with constant marginal cost  $MC = 9$ .

What price will the monopolist charge, to maximize its profit?

A) 48

B) 16

C) 9

D) 54

E) 3

## answer to question 8

Q	TB	MB	R	MR
1	20	20	20	20
2	38	18	36	16
3	54	16	48	12
4	68	14	56	8
5	80	12	60	4
6	90	10	60	0
7	98	8	56	- 4

Suppose that instead of perfectly competitive suppliers, there is a single monopolist, still with constant marginal cost  $MC = 9$ .

What price will the monopolist charge, to maximize its profit?

A) 48

B) 16

C) 9

D) 54

E) 3

## QUESTION 9 (monopolist)

Q	TB	MB	R	MR
1	20	20	20	20
2	38	18	36	16
3	54	16	48	12
4	68	14	56	8
5	80	12	60	4
6	90	10	60	0
7	98	8	56	- 4

Suppose that instead of perfectly competitive suppliers, there is a single monopolist, still with constant marginal cost  $MC = 9$ .

At its profit-maximizing price and quantity, how much producer surplus will the monopolist get?

A) 0

B) 21

C) 16

D) 48

E) 54

## answer to question 9

Q	TB	MB	R	MR
1	20	20	20	20
2	38	18	36	16
3	54	16	48	12
4	68	14	56	8
5	80	12	60	4
6	90	10	60	0
7	98	8	56	-4

$$MC = 9$$

At its profit-maximizing price and quantity, how much producer surplus will the monopolist get?

$$PS = R - VC$$

$$PS = P \times Q - \sum MC$$

$$PS = (16)(3) - (3)(9)$$

$$PS = 48 - 27 = 21$$

A) 0

B) 21

C) 16

D) 48

E) 54

## **QUESTION 10 (perfect competition with fixed cost)**

$$\text{TC} = 1000 + Q^2/20$$

$$\text{MC} = Q/10$$

**If the firm behaves as a price taker (as in a perfectly competitive market), and the given price is 50, then what quantity will the firm choose to produce?**

**A) 50**

**B) 5**

**C) 500**

**D) 25**

**E) 250**

## answer to question 10

$$\text{TC} = 1000 + Q^2/20$$

$$\text{MC} = Q/10$$

**If the firm behaves as a price taker (as in a perfectly competitive market), and the given price is 50, then what quantity will the firm choose to produce?**

$$P = MC \rightarrow Q/10 = P \rightarrow Q/10 = 50 \rightarrow Q = 500$$

**A) 50**

**B) 5**

**C) 500**

**D) 25**

**E) 250**

## **QUESTION 11 (perfect competition with fixed cost)**

$$\text{TC} = 1000 + Q^2/20$$

$$\text{MC} = Q/10$$

**If the firm behaves as a price taker (as in a perfectly competitive market), and the given price is 50, then the firm will choose to produce 500 units.**

**If it does so, what will its average total cost be?**

**A) 30**

**B) 27**

**C) 29**

**D) 25**

**E) 19**

## answer to question 11

$$\text{TC} = 1000 + Q^2/20$$

$$\text{MC} = Q/10$$

**If the firm behaves as a price taker (as in a perfectly competitive market), and the given price is 50, then the firm will choose to produce 500 units.**

**If it does so, what will its average total cost be?**

$$\text{ATC} = \text{TC}/Q$$

$$= 1000/Q + Q/20$$

$$= 1000/500 + 500/20 = 2 + 25 = 27$$

**A) 30**

**B) 27**

**C) 29**

**D) 25**

**E) 19**



## **QUESTION 12 (perfect competition with fixed cost)**

$$\text{TC} = 1000 + Q^2/20$$

$$\text{MC} = Q/10$$

**If the firm behaves as a price taker (as in a perfectly competitive market), and the given price is 50, then the firm will choose to produce 500 units.**

**If it does so, what will its profit be?**

- A) 9600      B) 27      C) 500      D) 11500      E) 13000**

## answer to question 12

$$\text{TC} = 1000 + Q^2/20$$

$$\text{MC} = Q/10$$

**If the firm behaves as a price taker (as in a perfectly competitive market), and the given price is 50, then the firm will choose to produce 500 units.**

**If it does so, what will its profit be?**

$$\begin{aligned}\Pi &= P \times Q - \text{TC} = P \times Q - \text{ATC} \times Q \\ &= Q \times (P - \text{ATC}) \\ &= 500(50 - 27) = 500(23) = 11500\end{aligned}$$

- A) 9600      B) 27      C) 500      D) 11500      E) 13000**

## **QUESTION 13 (continuous, perfect competition)**

$$\mathbf{TB = 24Q - Q^2}$$

$$\mathbf{MB = 24 - 2Q}$$

$$\mathbf{TC = .5Q^2}$$

$$\mathbf{MC = Q}$$

**What is the equilibrium price?**

**A) 12**

**B) 10**

**C) 24**

**D) 16**

**E) 8**

## answer to question 13

$$\text{TB} = 24Q - Q^2$$

$$\text{MB} = 24 - 2Q$$

$$\text{TC} = .5Q^2$$

$$\text{MC} = Q$$

**What is the equilibrium price?**

$$24 - 2Q = Q \rightarrow 3Q = 24 \rightarrow Q = 8$$

$$\text{MB} = 24 - 16 = 8$$

$$\text{MC} = 8$$

**A) 12**

**B) 10**

**C) 24**

**D) 16**

**E) 8**

## QUESTION 14 (price floor)

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

**If there is a price floor of 10, what is the quantity bought and sold in the new equilibrium?**

**A) 10**

**B) 7**

**C) 9**

**D) 12**

**E) 18**

## answer to question 14

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

**If there is a price floor of 10, what is the quantity bought and sold in the new equilibrium?**

$$\text{Demand... } MB = P \rightarrow 24 - 2Q = 10$$

$$\rightarrow 2Q = 14 \rightarrow Q_d = 7$$

$$\text{Supply... } MC = P \rightarrow Q = P \rightarrow Q_s = 10$$

$$Q = 7$$

**A) 10**

**B) 7**

**C) 9**

**D) 12**

**E) 18**

## QUESTION 15 (excise tax)

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

If there is a tax of 12 per unit, then what will be the quantity in the new equilibrium?

A) 0

B) 2

C) 4

D) 10

E) 12

## answer to question 15

$$\text{TB} = 24Q - Q^2$$

$$\text{MB} = 24 - 2Q$$

$$\text{TC} = .5Q^2$$

$$\text{MC} = Q$$

If there is a tax of 12 per unit, then what will be the quantity in the new equilibrium?

$$24 - 2Q = Q + 12$$

$$3Q = 12$$

$$Q = 4$$

A) 0

B) 2

C) 4

D) 10

E) 12



## QUESTION 16 (excise tax)

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

If there is a tax of 12 per unit, then the quantity in equilibrium will be 4.

How much revenue will the government get from the tax?

A) 60

B) 96

C) 4

D) 48

E) 12

## answer to question 6

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

If there is a tax of 12 per unit, then the quantity in equilibrium will be 4.

How much revenue will the government get from the tax?

$$G = tQ = (12)(4) = 48$$

A) 60

B) 96

C) 4

D) 48

E) 12

## QUESTION 17 (excise tax)

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

If there is a tax of 12 per unit, then the quantity in equilibrium will be 4.

How much surplus will producers get?

A) 16

B) 2

C) 4

D) 12

E) 8

## answer to question 17

$$\text{TB} = 24Q - Q^2$$

$$\text{MB} = 24 - 2Q$$

$$\text{TC} = .5Q^2$$

$$\text{MC} = Q$$

If there is a tax of 12 per unit, then the quantity in equilibrium will be 4.

How much surplus will producers get?

$$\text{PS} = (.5)(4)(4) = 8$$

A) 16

B) 2

C) 4

D) 12

E) 8

## QUESTION 18 (positive externality)

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

If the good has an external benefit to society of 6 per unit, then what is its socially optimal quantity?

A) 6

B) 7

C) 4

D) 10

E) 8

## answer to question 18

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

**If the good has an external benefit to society of 6 per unit, then what is its socially optimal quantity?**

$$MSB = MSC$$

$$24 - 2Q + 6 = Q$$

$$3Q = 30$$

$$Q = 10$$

**A) 6**

**B) 7**

**C) 4**

**D) 10**

**E) 8**

## **QUESTION 19 (positive externality)**

$$\text{TB} = 24Q - Q^2$$

$$\text{MB} = 24 - 2Q$$

$$\text{TC} = .5Q^2$$

$$\text{MC} = Q$$

**If the good has an external benefit to society of 6 per unit, then its socially optimal quantity is 10.**

**What per-unit subsidy will cause the market to reach this socially optimal quantity in equilibrium?**

**A) 16**

**B) 1**

**C) .5**

**D) 24**

**E) 6**

## answer to question 19

$$TB = 24Q - Q^2$$

$$MB = 24 - 2Q$$

$$TC = .5Q^2$$

$$MC = Q$$

**If the good has an external benefit to society of 6 per unit, then its socially optimal quantity is 10.**

**What per-unit subsidy will cause the market to reach this socially optimal quantity in equilibrium?**

**A) 16**

**B) 1**

**C) .5**

**D) 24**

**E) 6**



## **QUESTION 20 (labor market)**

$$Q(N) = 60N - .5N^2$$

$$MP(N) = 60 - N$$

**These functions describe how the total output (Q) and the marginal product (MP) depend on the quantity of labor (N) that a given firm hires.**

**If the firm's good sells for \$5, and assuming that the labor market is competitive, which function correctly describes how the firm's demand for labor will depend on the market wage?**

**A)  $DL_i = 20 - 3W$**

**B)  $DL_i = 40 - W$**

**C)  $DL_i = 60 - W/5$**

**D)  $DL_i = 80 - W/2$**

**E)  $DL_i = 10 - 5W$**

## answer to question 20

$$Q(N) = 60N - .5N^2$$

$$MP(N) = 60 - N$$

$$P = 5$$

$$VMP(N) = 300 - 5N$$

$$VMP = W$$

$$300 - 5N = W$$

$$5N = 300 - W$$

$$N = 60 - W/5$$

$$\text{C) } DL_i = 60 - W/5$$

## **QUESTION 21 (labor market)**

$$\mathbf{Q(N) = 60N - .5N^2}$$

$$\mathbf{MP(N) = 60 - N}$$

$$\mathbf{P = 5}$$

$$\mathbf{VMP(N) = 300 - 5N}$$

$$\mathbf{DL_i = 60 - W/5}$$

**Suppose that there are 10 firms buying labor in this particular labor market, and each firm is identical in terms of having the production function, price, demand function, etc. listed above.**

**If the supply of labor is perfectly inelastic at  $SL = 500$ , then what will the wage be in equilibrium?**

**A) 300**

**B) 60**

**C) 50**

**D) 500**

**E) 600**

## answer to question 21

$$Q(N) = 60N - .5N^2$$

$$MP(N) = 60 - N$$

$$P = 5$$

$$VMP(N) = 300 - 5N$$

$$DL_i = 60 - W/5$$

$$10 \text{ firms} \rightarrow \text{total DL} = 600 - 2W$$

$$SL = 500$$

$$DL = SL$$

$$600 - 2W = 500$$

$$2W = 100$$

$$W = 50$$

A) 300

B) 60

C) 50

D) 500

E) 600