**Econ 101**
**Summer 2015**
**Answers to Second Mid-term**
**Date: June 15, 2015**

**Student Name ________________________**

**Version 1**

**READ THESE INSTRUCTIONS CAREFULLY.**

**DO NOT BEGIN WORKING UNTIL THE PROCTOR TELLS YOU TO DO SO**

You have 75 minutes to complete this exam including the **"bubbling in of your scantron"**. The exam consists of three parts: Part I is 10 binary response questions worth 2 points each for a total of 20 points; Part II is 20 multiple choice questions worth 3 points each for a total of 60 points; and Part III is two problems worth 10 points each for a total of 20 points. Total number of points on the exam is 100 points. Answer all questions on the scantron sheet with a #2 pencil.

**DO NOT PULL THE EXAM APART OR REMOVE THE STAPLE.**

**WARNING: NO COMMUNICATION OR CALCULATING DEVICES, OR FORMULA SHEETS ARE ALLOWED. NO CONSULTATION AND CONVERSATION WITH OTHERS ARE ALLOWED WHILE YOU ARE TAKING EXAM OR IN THE EXAM ROOM. PLAGIARISM IS A SERIOUS ACADEMIC MISCONDUCT AND PUNISHABLE TO THE FULLEST EXTENT.**

**PICK ONLY ONE BEST ANSWER FOR EACH BINARY CHOICE OR MULTIPLE CHOICE QUESTION.**

**How to fill in the scantron sheet and other information:**

1. Print your **last name, first name, and middle initial** in the spaces marked "Last Name," "First Name," and "MI." Fill in the corresponding bubbles below.
2. Print your **student ID number** in the space marked "Identification Number." Fill in the bubbles.
3. In "Special Code" column A, please enter your exam version number (located at the top of this page) and then bubble in that number in column A.

- **If you believe there is an error on the exam or you do not understand something, make a note on your exam booklet and the issue will be addressed AFTER the examination is complete. No questions regarding the exam can be addressed while the exam is being administered.**
- **When you are finished, please get up quietly and bring your scantron sheet and this exam booklet to the place indicated by the proctor.**

**Problem One: (10 points total)** ______________

**Problem Two: (10 points total)** ______________

**(This page is intentionally left blank as an extra work sheet.)**
**DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!**

I, ______________________________, agree to neither give nor receive any help on this exam from others. I understand that the use of a calculator or communication device on this exam is academic misconduct. I also understand that providing answers to questions on this exam to other students is academic misconduct, as is taking or receiving answers to questions on this exam from other students. Thus, I will cover my answers and not expose my answers to other students. It is important to me to be a person of integrity and that means ALL ANSWERS on this exam are my answers. Any violation of these guidelines will result in a penalty of at least receiving a zero on this exam.

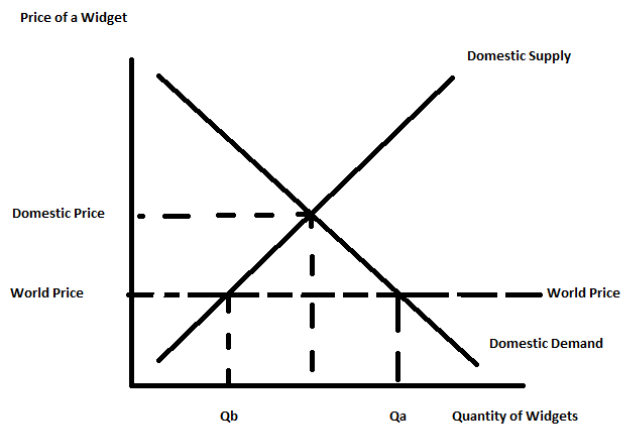
Signed ______________________________________

**I. Binary Choice: (10 questions @ 2 points each = 20 points)**

1. An example of inelastic demand would be the demand for:
a) an operation to get your appendix removed if it was about to rupture.
b) a double chocolate frozen custard in a waffle cone.

2. Which statement is correct? The more elastic the demand for a good is:
a) the greater the revenue increase from an increase in the price of that good.
b) the greater the revenue increase from a reduction in the price of that good.

Use the figure below of the market for widgets in a small, open economy to answer this question.




3. Given the above graph, what quantity is the quantity supplied by domestic producers of widgets?
a) $Q_a$
b) $Q_b$

4. Suppose the government imposes an excise tax on bicycles. It requires suppliers of bicycles to pay a $50 tax on every bicycle they sell. The **economic** incidence of the tax refers to:
a) the fact that the seller pays the tax, not the buyer.
b) the degree to which the seller can shift part of the tax to the buyer by charging a higher price.

5. Suppose the government imposes an excise tax on 20 different goods, and in each case requires the seller to pay a tax to the government equal to $10 for each unit it sells. Among these twenty goods, the seller will pay more of the tax relative to the buyer:
a) the more elastic is the demand for the good.
b) the less elastic is the demand for the good.

6. In comparing college tuition at the University of Wisconsin between 2005 and 2015, which price is a price adjusted for inflation?
a) The nominal price
b) The real price

7. George has $100 in income and the price of Good A is $10, whereas the price of Good B is $20. Let $Q_A$ be the quantity of Good A that George consumes and let $Q_B$ be the quantity of Good B George consumes. Given this information, which of the two combinations below is it possible for George to consume?
a) $Q_A = 6$, $Q_B = 2$
b) $Q_A = 2$, $Q_B = 6$

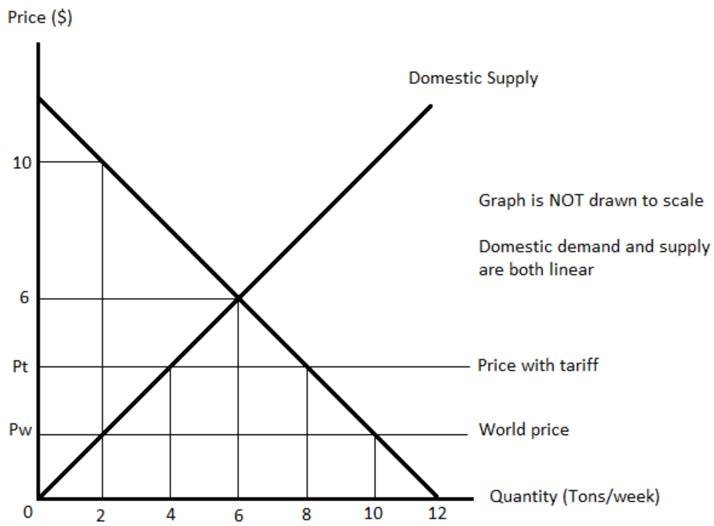
8. George wants to consume some of Good A and some of Good B. A particular indifference curve for George for Good A and Good B represents:
a) all the combinations of Good A and Good B at which George would be equally satisfied.
b) all the combinations of Good A and Good B that George can afford to consume given his income and the prices of the two goods.

9. Suppose a manufacturer of custom-made canoes has a facility where these canoes are made. The size of the facility is such that six people can work comfortably in the facility and be productive. However, there is room enough in the facility for more than six people to work and adding additional people beyond six does increase production. Therefore, the manufacturer hires more than six people when he needs to produce canoes faster than he can with six people. In fact, hiring a seventh person allows him to increase weekly production of canoes from 100 to 112 per week. In the context of this example, the concept of diminishing marginal returns would predict that hiring an eighth person would:
a) cause the total output of canoes per week to fall below 112 canoes.
b) allow a further increase in total output of canoes per week, but the increase would be smaller than 12 canoes.

10. In perfect competition each producer can sell the good only:
a) at the market price, which means the producer is a "price taker".
b) by being so competitive that the producer's price is below the market price.

**II. Multiple Choice: (20 Questions @ 3 points each = 60 points)**

Use the figure below to answer the next **<u>THREE (3)</u>** questions.
This figure depicts the market for a small economy for good X. In this figure the domestic demand and domestic supply curves are linear.




11. If the market represented in the above graph is closed to trade, then the value of consumer surplus is _____, the value of producer surplus is _____, and the value of total surplus is _____.
a) $36; $18; $54
b) $36; $36; $72
c) $24; $24; $48
d) $18; $18; $36

12. Suppose this market opens to trade. If this market is open and there is no tariff, then the value of consumer surplus is _____, the value of producer surplus is _____, and the value of total surplus is _____.
a) $34; $2; $36
b) $50; $4; $54
c) $50; $2; $52
d) $18; $4; $22

13. Suppose this market opens to trade but at the same time the government imposes a tariff as marked in the graph on this good. Then, the value of consumer surplus is _____, the value of producer surplus is _____, and the value of total surplus is _____.
a) $32; $16; $48
b) $32; $8; $40
c) $64; $8; $72
d) $64; $4; $68

Use the following information to answer the next **THREE (3)** questions.

Donald Zurcher is operating a bus company that is a monopoly in Econtown. Demand for bus trips is given by P = 4 – (1/2000)Q, where the price is in dollars and Q is the quantity of bus trips per day.

14. What is the point elasticity of demand for bus trips when P = $1?
a) 1/3
b) -1/2000
c) 2/3
d) 1

15. What is the equation for the marginal revenue curve for Donald Zurcher's bus company?
a) MR = 4 – (1/1000)Q
b) MR = 4 – (1/2000)Q
c) MR = 8 – (1/1000)Q
d) MR = 8 – (1/2000)Q

16. Now suppose that Super, a taxi company, increases their prices. Which of the following could Donald Zurcher use to predict the effect of this price increase on the quantity demanded for his company's bus trips?
a) The elasticity of demand for bus trips with respect to the price of bus trips.
b) The cross-price elasticity of demand for bus trips and taxi rides.
c) The income elasticity of demand for bus trips.
d) The elasticity of supply of bus trips with respect to the price of bus trips.

Use the information below to answer the next **<u>THREE (3)</u>** questions.

Consider the market for picture frames that can be described by the following equations where Q is the quantity of picture frames and P is the price per picture frame:

Demand for Picture Frames: $Q = 10 - (1/4)P$

Supply of Picture Frames: $Q = P$

Suppose that in this market for picture frames an excise tax of $5 per picture frame is imposed on producers of these frames.

17. Prior to the imposition of the tax, the total surplus in this market is equal to _____; after the imposition of this tax, the total surplus in this market (include the government's share of the surplus as part of the total surplus) is equal to _____; and the deadweight loss due to this tax is equal to _____.

a) $40.00; $16; $2.50

b) $160.00; $108.00; $5

c) $320.00; $157.20; $5

d) $160.00; $157.50; $2.50

18. Given the imposition of this excise tax on picture frames, relative to the initial pre-tax equilibrium price, the price per unit paid by consumers _____ while the net price received by producers _____.

a) increases by $5; decreases by $0

b) increases by $1; decreases by $4

c) increases by $4; decreases by $4

d) increases by $4; decreases by $1

19. Suppose that the demand curve is not the one you were provided but is instead a perfectly inelastic demand curve that can be written as:

Demand for picture frames: $Q = 6$

If the government imposes an excise tax of $5 per picture frame given this demand curve, then the price to consumers once the excise tax is imposed would be _____, the quantity of picture frames sold would be _____, and the total tax collected by the government would equal _____.

a) $11.00; 2; $8.00

b) $10.00; 6; $30.00

c) $11.00; 6; $30.00

d) $16.00; 6; and $30.00

Use the information provided below to answer the next **THREE (3)** questions.

Suppose an individual has $120 available to spend on widgets (measured on the x -axis) and gadgets (measured on the y-axis). This individual knows that the price of widgets is $10 per unit and the price of gadgets is also $10 per unit. When this individual maximizes their utility given their income and the prices of the two goods she consumes a bundle of widgets and gadgets that consists of 6 widgets and six gadgets.

When the price of widgets falls to $5 per unit and everything else is held constant, this individual consumes a bundle of widgets and gadgets that consists of 8 widgets and 8 gadgets.

If this consumer were constrained to face the new prices (price of a widget is $5 per unit and the price of a gadget is $10 per unit) while having the same level of utility as she had initially, the consumer would consume 10 widgets and 4 gadgets.

20. Given this information, the income effect of the fall in the price of widgets from $10 per unit to $5 per unit is equal to:
a) an increase of 2 widgets.
b) an increase of 4 widgets.
c) a decrease of 4 widgets.
d) a decrease of 2 widgets.

21. Given this information, the substitution effect of the fall in the price of widgets from $10 per unit to $5 per unit is equal to:
a) an increase of 2 widgets.
b) an increase of 4 widgets.
c) a decrease of 4 widgets.
d) a decrease of 2 widgets.

22. Given this information, the income compensated budget line (what we called budget line 3 in class) is one based upon the new prices (price of widgets is $5 per unit and price of gadgets is $10 per unit) and just tangent to the initial indifference curve. In this example, this budget line is drawn with an income level that is equal to:
a) $210, since the change in the price of widgets resulted in this consumer having greater purchasing power.
b) $120, since in these problems income is held constant no matter if a price change alters the consumer's real purchasing power.
c) $90, since the change in the price of widgets resulted in this consumer having greater purchasing power.
d) $150, since the change in the price of widgets resulted in this consumer having greater purchasing power so to find the new budget line 3 the consumer's income must be increased due to this increase in purchasing power.

23. When Juanita finished college she took a job in August of 2014 for $40,000. Her mother told Juanita that she (the mother) took a job when she finished college in 1994, and it paid only $33,000. She said Juanita was much better off than she (the mother) had been in her first job after college. Juanita had taken economics while she was in college. She told her mother that it wasn't clear who earned more, in real terms, adjusted for inflation. Juanita looked up the CPI for 1994 and 2014, and found it was 180 and 240, respectively. Based on this information which one of the following statements is correct?

a) We do not have enough information to convert the mother's salary to its equivalent measured in 2014 dollars.

b) Juanita's mother earned $44,000 expressed in 2014 dollars.

c) Juanita's mother earned ($33,000) * (180/240) * 100%, expressed in 2014 dollars.

d) Juanita earned $33,000 * (180/240) * 100%), expressed in 2014 dollars.

24. In January of 1995 the CPI was 150 and by April 2011 it was 225. By what percentage did prices rise as measured by the CPI between January 1995 and April 2011?

a) 1.50%

b) 75%

c) 33%

d) 50%

25. Suppose that Joey's demand for ice cream cones is given by the following equation where P is the price in dollars per ice cream cone and Q is the number of ice cream cones:

$$Q = 100 - 10P$$

Currently the price of an ice cream cone is $2. Using the arc elasticity formula calculate the price elasticity of demand if the price of an ice cream cone increases by $1. The price elasticity of demand equals:

a) 4.

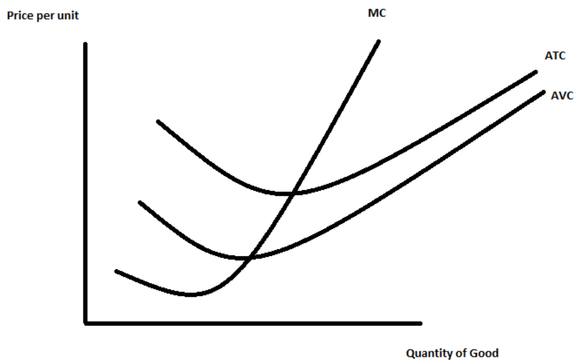
b) 1/4.

c) 3.

d) 1/3.

Use the figure below of a firm's cost curves to answer the next **<u>TWO (2)</u>** questions.

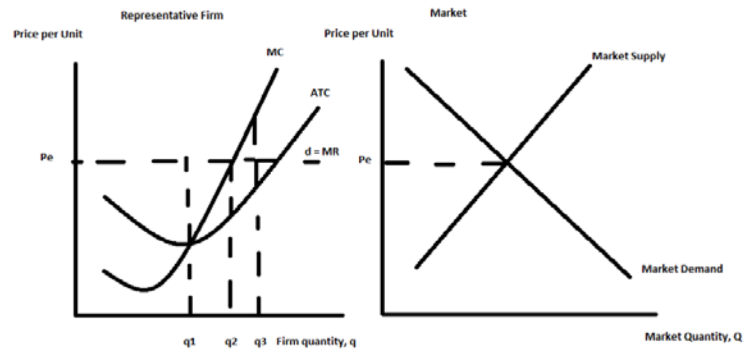
In this figure, MC is the marginal cost curve, ATC is the average total cost curve, and AVC is the average variable cost curve.




26. In the above figure, at quantities of output where points on the marginal cost curve lie below points on the average total cost curve, the production of an additional unit of the good:
a) increases total cost by less than the average cost per unit.
b) increases total cost by more than the average cost per unit.
c) reduces total cost.
d) reduces fixed cost.

27. Based on the above figure:
a) the firm must always operate at the quantity of output at which MC and ATC intersect.
b) the firm must always operate at the quantity of output at which MC and AVC intersect.
c) the firm's average fixed cost must be declining as the quantity of output increases.
d) the firm's total fixed cost increases as the quantity of output increases.

Use the figure below of a perfectly competitive market and a representative firm in this market to answer the next **THREE (3)** questions.




28. The firm views its demand curve, d, as horizontal at the market price, because:
a) the market demand for this product is perfectly elastic.
b) the firm believes the demand for this good is perfectly inelastic.
c) the firm is a price-taker, and it behaves as if it can sell as much of the good as it wants without affecting the market price of the good.
d) the firm is a price-taker, but the firm believes it will still affect the price of the good if it sells too much of the good.

29. We know that a perfectly competitive firm can vary the amount of output it produces and sells in the market. Given the above graphs, this firm will maximize its profits at:
a) $q_1$ because total revenue will increase more than total cost if the firm increases output by one unit.
b) $q_2$ because at q less than $q_2$, the firm when it increases output by one unit will raise revenue more than it increases cost, and at q more than $q_2$, the firm when it increases output by one unit will raise cost more than it increases revenue.
c) $q_3$ because at q less than $q_3$, the firm when it increases output by one unit will raise revenue more than it increases cost.
d) $q_3$ because the higher the output, the more of the good the firm can sell without lowering the price of the good.

30. A firm maximizing profits in this market will have _____ economic profits in the short run and in the long run _____ of firms will cause the supply curve to shift to the _____, which will cause economic profits for the firms in the market to go to zero.
a) negative; exit; left
b) positive; exit; left
c) positive; entry; left
d) positive; entry; right

**III. PROBLEMS: (2 problems @ 10 points = 20 points)**

1. The market for bananas in a small, closed economy can be described by the following domestic demand and domestic supply curves where P is the price per unit of bananas in dollars and Q is the quantity of bananas **in thousands**:

Domestic Demand: $P = 200 - 10Q$

Domestic Supply: $P = 20 + 20Q$

In the world market for bananas the price is $40 per unit of bananas.

a) (1 Point) Below what price will this country import bananas if it opens its banana market to trade with the rest of the world?

Computing the domestic equilibrium:

$200 – 10Q = 20 + 20Q$ gives $Q = 6$, so $P = \$140$

Hence at prices below $140 this economy will import bananas.

b) (2 Points) Once this economy opens the banana market to trade how many units will be imported or exported? Give a number and indicate if the economy is importing or exporting. Hint: Provide units of measurement in your answer-and be thoughtful here!

Since 40 < 140, the economy will import bananas when it opens this market to trade. To calculate imports first calculate the quantity demanded domestically and the quantity supplied domestically: the difference is the quantity of imports.

Substituting $P = 40$ into domestic demand gives:

$40 = 200 – 10Q$

$10Q = 160$

$Q_D = 16$

Substituting $P = 40$ into supply gives:

$40 = 20 + 20Q$

$Q_S=1$

Hence 15,000 bananas will be imported.

c) (3 Points) Suppose the government of this small economy opens the market for bananas to trade but imposes an import quota of 9,000 bananas. What price will bananas sell for in this small economy after the quota has been imposed?

Recall how to do this from class and the homework: we need to find the price such that the quantity of imports, i.e. the difference between the quantity demanded and the quantity supplied, is 9. In algebra we are after the P such that $Q_D - Q_S = 9$. Begin by rewriting domestic demand and supply to have quantity on the left hand side:

$Q_D = 20 – P/10$, $Q_S = P/20 – 1$

Then:

$20 – P/10 – (P/20 – 1) = 9$

$(3/20)P = 12$

P = 80

d) (2 points) From class discussion we know that imposition of an import quota in an open market results in deadweight loss. Calculate the value of deadweight loss <u>due to having less efficient domestic producers produce more</u> bananas once this import quota is imposed. Hint: Show your work-be careful to get the right "scale" of units in your final answer.

Domestic producers would produce only 1,000 bananas at the world price, whereas with the quota they produce $Q_S = 80/20 – 1 = 3$ = 3,000 bananas (since Q is in thousands). Hence the "bananas in Wisconsin" deadweight loss is (1/2)*(80-40)*(3-1)*1000 = (1/2)*(40)*2*1000 = $40,000

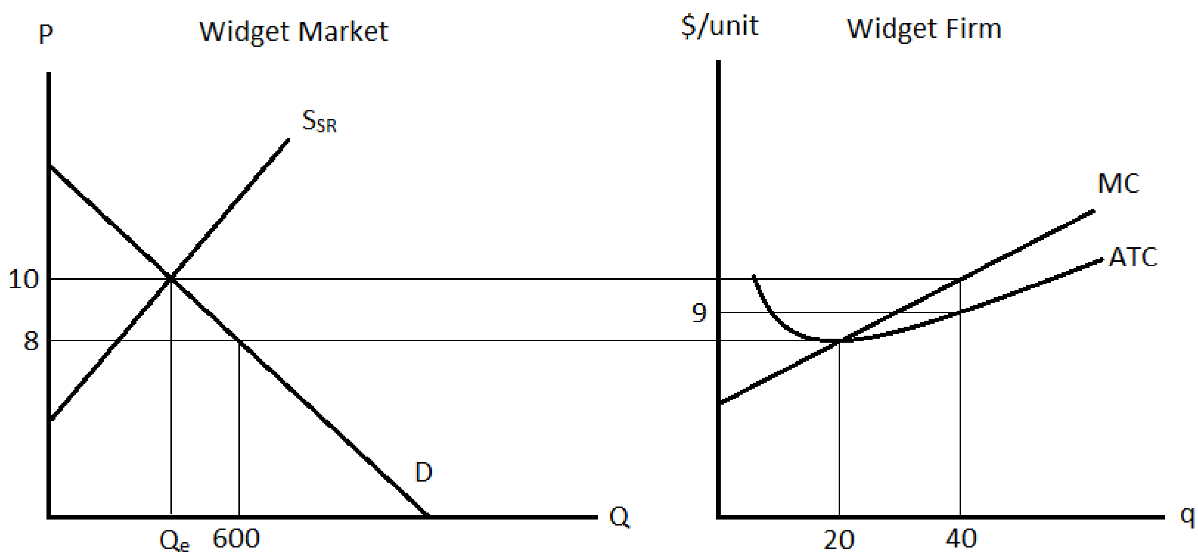
e) (2 points) Instead of using a quota the government could have imposed a tariff. Assuming the government did not impose a quota, fill in the table below.

| Tariff | Imports |
|---|---|
| $0/unit of bananas | |
| | 9,000 bananas |

Since the domestic price increased from $40 (the world price) per unit of bananas to $80 per unit of bananas with the import quota, a tariff of $40 per unit of bananas would achieve the same quantity of imports. A tariff of $0 per unit of bananas would give the quantity of imports at the world price, i.e. 15,000 bananas. Hence the table should look like this:

| Tariff | Imports |
|---|---|
| $0/unit of bananas | 15,000 bananas |
| $40/unit of bananas | 9,000 bananas |

2. The figure below illustrates the market for widgets, which is initially in an equilibrium with supply given by $S_{SR}$ and demand D. The market for widgets is perfectly competitive and all firms are identical with marginal cost and average total cost as shown in the figure below. Price is in dollars and all quantities are in units of widgets.




a) (1 Point) What quantity will each individual firm produce in this market in the initial short-run equilibrium? State which two things the firm is setting equal to each other to maximize profits.

Firms maximize profits by setting MR = MC, which is the same as P = MC in perfect competition. From the diagram this means firms choose a quantity of 40 widgets at the initial price of $10 per widget.

b) (1 Point) Suppose in the initial short-run equilibrium there are 10 firms in this market. What is the market quantity ($Q_e$) in this equilibrium?

(40 widgets per firm)*(10 firms) = 400 widgets

c) (2 Points) In the initial short-run equilibrium each firm has total revenue of _____ and has total costs of _______ . Show how you found your answers for full credit!

The price is $10 and each firm sells 40 units, so total revenue for each firm is $400. Since ATC = 9, TC = (40 widgets)($9 per widget) = $360.

d) (1 Point) Will firms enter or exit this industry in the long run? Briefly explain how you determined whether there would be long run entry or exit and what will happen to the supply curve in this market in the long run.

Firms in this market are making profits, since TR > TC. Hence, in the long run other firms will enter the market in order to also make profits. This will shift the market supply curve to the right.

e) (1 Point) At the breakeven point for all firms in this market the price is ____ and firms produce a quantity of _____ . Briefly justify your answer.

The breakeven point occurs when MC = P = ATC, so it occurs when each firm sells 20 widgets at a price of $8 per widget.

f) (2 Points) Determine the values of each of the following when this market operates in the long run.

The market price = _____________

The market quantity = ________________

The number of firms in the market = _________________

The market price will just be the breakeven price, $8, since that ensures firms make zero profit. From the diagram the market quantity will be 600. Since each firm makes 20 units, there must be 30 firms (600/20 = 30).

The market price = _______$8 per widget______

The market quantity = ______600 widgets__________

The number of firms in the market = ______30 firms___________

g) (2 points) Suppose each firm has an average variable cost equation given by AVC = (1/10)q + 4. Calculate the fixed costs of each firm.

Recall that ATC = AVC + AFC. Hence if we know ATC and AVC at a point we can figure out AFC, which will give us FC. You can choose q = 20 widgets or q = 40 widgets: both will work. Let's go with q = 20 widgets, since smaller numbers are easier to work with. Then ATC = $8/widget from the diagram. AVC = 2 + 4 = $6/widget, so AFC = $2/widget. Then FC = ($2/widget)(20 widgets) = $40.