

SEATTLE PACIFIC UNIVERSITY
School of Business, Government, and Economics
Economics 2101 Principles of Microeconomics
Practice Assignment 1

Part A

1. The quantity demanded for coats depends on the price, according to this formula:

$$\text{quantity demanded} = Q_d = 250 - 3P$$

The quantity supplied depends on the price, according to this formula:

$$\text{quantity supplied} = Q_s = 10 + 5P$$

Fill in the table showing the quantity supplied and the quantity demanded for each possible price. Identify what is the price that makes the quantity supplied equal to quantity demanded.

Example: if $P = 5$, then

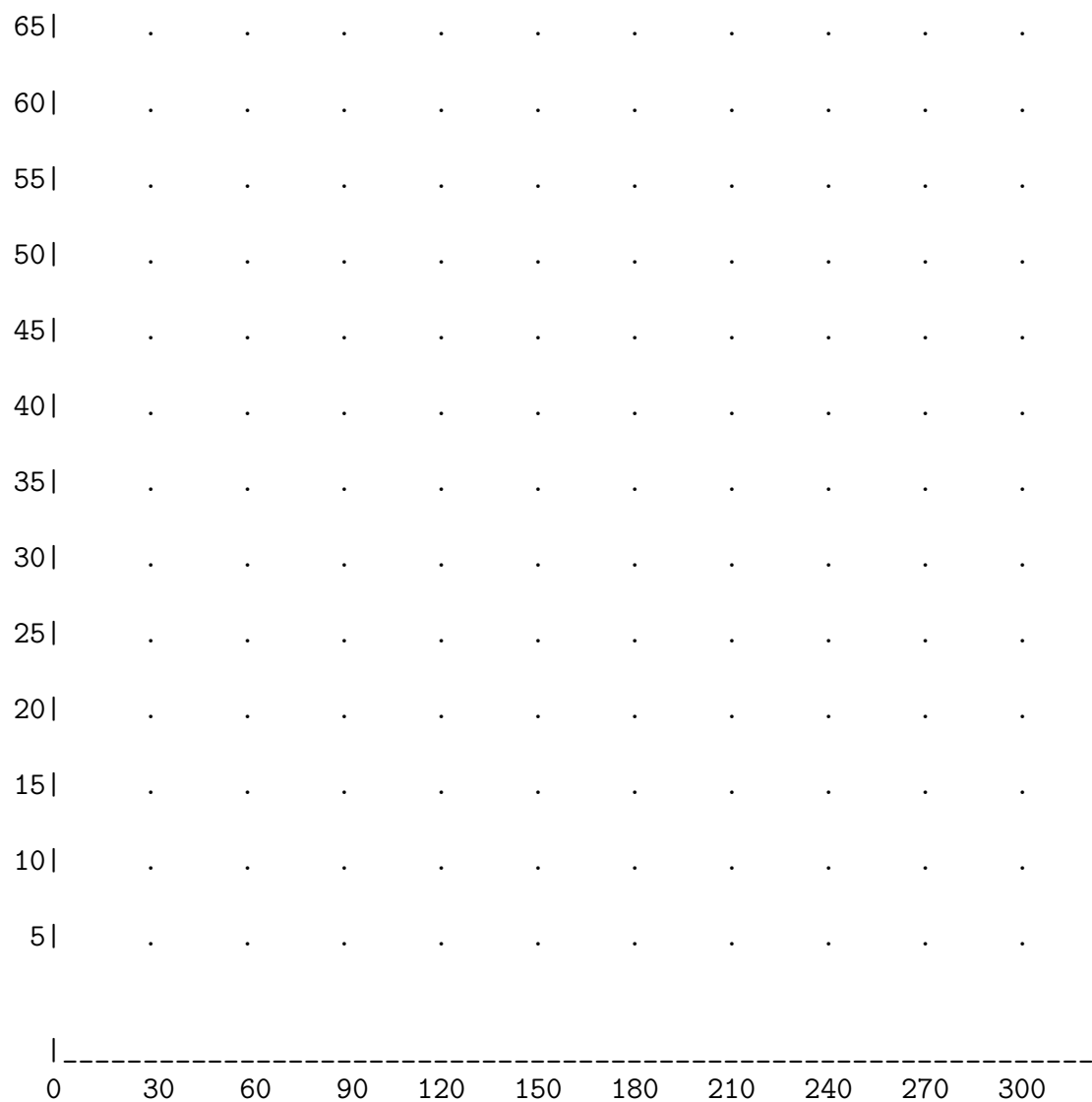
$$Q_d = 250 - 3 \times 5 = 250 - 15 = 235$$

and

$$Q_s = 10 + 5 \times 5 = 10 + 25 = 35$$

P	Q_d	Q_s
5	-----	-----
10	-----	-----
15	-----	-----
20	-----	-----
25	-----	-----
30	-----	-----
35	-----	-----
40	-----	-----
45	-----	-----
50	-----	-----
55	-----	-----
60	-----	-----

2. Make a graph of the supply and demand diagram, by putting a mark on the graph corresponding to each point in the table above, and then connect all of the demand curve points, and then connect all of the supply curve points. Be sure to label each axis and each curve.



- Solve for the value of the equilibrium price. To do this, set the formula for the quantity demanded ($250 - 3P$) equal to the formula for quantity supplied ($10 + 5P$). Then add, subtract, multiply, or divide both sides of the equation until you have isolated P on one side of the equation, and everything else on the other side. (While you are doing this, it is important to make sure you do the same thing to each of the two sides of the equation). Does the answer for the equilibrium price match

the result you found earlier for where the quantity supplied equals the quantity demanded?

Solve for the equilibrium price for each of these. Round each answer to two decimal places.

4. $Q_d = 92 - 8P$
 $Q_s = 6 + 2P$
5. $Q_d = 160 - 0.60P$
 $Q_s = 12 + 2.50P$
6. $Q_d = 160 - 5P$
 $Q_s = 12 + 2.50P$
7. $Q_d = 10,450 - 3.30P$
 $Q_s = 46 + 0.40P$
8. $Q_d = 18,237 - 2.80P$
 $Q_s = 49 + 1.20P$

Part B

For each question below, determine if there will be an increase or decrease in supply or demand, and indicate if the price or quantity will increase or decrease. Include a diagram if the question includes graphing axes. Be sure to label the axes on each diagram, and label all curves, and use an arrow to show a shift in a curve.

9. How will the market for services that provide ground transportation to the airport be affected if there is an increase in the price of airline tickets?

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10. How will the market for business travelers going to meetings be affected by an increase in the price of airline fuel?

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11. How will the market for vacation travelers going to Hawaii be affected by an increase in the price of airline fuel?

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12. How will the market for surfboard rentals in Hawaii be affected if there is an increase in the price of airline fuel?

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13. How will the market for beachfront hotels in California be affected if there is an increase in the price of beachfront hotels in Hawaii?

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14. How will the market for smartphone accessories (such as covers) be affected if there is a fall in the price of smartphones?

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15. How will the market for automobiles be affected by an increase in the price of gasoline?

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16. How will the market for blue sweaters be affected if the most popular music star in the world performs a new megapopular song wearing a stylish blue sweater?

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17. If a sports team attracts a crowd of new fans because it is having a super successful season, and it makes it to the championship game, how will this affect the market for tickets to the championship game?

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18. Suppose there is a sudden increase in the popularity of apples when people hear about a new study on the health benefits of apples. How will this affect the market for apples next week? How will the affect the market for apples five years from now? (Assume that the popularity of apples remains constant for the next five years).

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19. How will the market for residential air conditioning in Seattle be affected by a decrease in the price of electricity? How will the answer be different in southern Arizona?
20. How is the market for residential landline phones different than it was 50 years ago?
21. How has the demand for baby strollers changed in the last 70 years?
22. Describe an example of an inferior good and describe a situation where the demand for that good changes.
23. How will the market for coffee be affected if there is an increase in the sales tax on coffee?

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24. How will the market for pumpkin spice lattes be affected if there is an increase in the sales tax on pumpkin spice lattes (but no change in the tax on other kinds of coffee drinks)?

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Part C

Calculate the elasticity between each pair of points on the demand curve. Round the answer to three decimal places. You can take the absolute value of the answer (convert negative values to positive values). Also calculate the revenue at each of the two points, and determine if revenue is greater at the higher price or the lower price.

25. $P_1 = 124$; $Q_1 = 48$
 $P_2 = 130$; $Q_2 = 44$
26. $P_1 = 523$; $Q_1 = 1,200$
 $P_2 = 542$; $Q_2 = 497$
27. $P_1 = 520$; $Q_1 = 1,200$
 $P_2 = 542$; $Q_2 = 1,180$
28. $P_1 = 36$; $Q_1 = 96$
 $P_2 = 48$; $Q_2 = 72$
29. $P_1 = 64$; $Q_1 = 138$
 $P_2 = 60$; $Q_2 = 132$
30. $P_1 = 67$; $Q_1 = 75$
 $P_2 = 60$; $Q_2 = 132$
31. $P_1 = 17$; $Q_1 = 69$
 $P_2 = 16$; $Q_2 = 81$
32. $P_1 = 40$; $Q_1 = 197$
 $P_2 = 34$; $Q_2 = 264$
33. $P_1 = 130$; $Q_1 = 742$
 $P_2 = 120$; $Q_2 = 800$
34. $P_1 = 58$; $Q_1 = 802$
 $P_2 = 42$; $Q_2 = 820$

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Practice Assignment 1 Answers

Part A

1. .

P	Q_d	Q_s
5	235	35
10	220	60
15	205	85
20	190	110
25	175	135
30	160	160
35	145	185
40	130	210
45	115	235
50	100	260
55	85	285
60	70	310

2. The graph is online.

3.

$$Q_d = Q_s$$

$$250 - 3P = 10 + 5P$$

Add $3P$ to both sides:

$$250 - 3P + 3P = 10 + 5P + 3P$$

The last two terms on the left can be cancelled, and the last two terms on the right can be combined:

$$250 = 10 + 8P$$

Subtract 10 from both sides:

$$250 - 10 = 8P$$

Perform the subtraction on the left side:

$$240 = 8P$$

Divide both sides by $q_{ss} + q_{ds} = 8$:

$$\frac{240}{8} = P$$

$$30 = P$$

Verify that the quantity demanded and quantity supplied are the same at this price:

$$Q_d = 250 - 3 \times 30 = 160$$

$$Q_s = 10 + 5 \times 30 = 160$$

4.

$$92 - 8P = 6 + 2P$$

$$92 - 8P + 8P = 6 + 2P + 8P$$

$$92 = 6 + 10P$$

$$92 - 6 = 10P$$

$$86 = 10P$$

$$\frac{86}{10} = P$$

$$8.60 = P$$

$$Q_d = 92 - 8 \times 8.60 = 23.20$$

$$Q_s = 6 + 2 \times 8.60 = 23.20$$

5.

$$160 - 0.60P = 12 + 2.50P$$

$$160 = 12 + 3.10P$$

$$148 = 3.10P$$

$$P = \frac{148}{3.10} = 47.74$$

$$Q_d = 160 - 0.60 \times 47.74 = 131.35$$

$$Q_s = 12 + 2.50 \times 47.74 = 131.35$$

6.

$$160 - 5P = 12 + 2.50P$$

$$148 = 7.50P$$

$$\frac{148}{7.50} = P$$

$$19.73 = P$$

$$Q_d = 61.33 = Q_s = 61.33$$

7.

$$10,450 - 3.30P = 46 + 0.40P$$

$$2,811.89 = P$$

$$Q_d = Q_s = 1,170.76 = Q_s = 1,170.76$$

8.

$$18,237 - 2.80P = 49 + 1.20P$$

$$4,547 = P$$

$$Q_d = Q_s = 5,505.40 = Q_s = 5,505.40$$

Part B

9. These two products are complements, so there will be a decrease in demand for ground transportation.
10. The increase in the price of fuel will cause a decrease in the supply of airline travel. The demand is likely very inelastic.
11. The increase in the price of fuel will cause a decrease in the supply of airline travel. The demand is likely somewhat elastic.
12. The decrease in supply of airline travel will likely lead to higher prices for airline tickets and a smaller quantity of tickets sold to Hawaii. The surfboard rentals are complements to the Hawaii tickets, so there will be a decline in demand for surfboard rentals.
13. These are substitutes, so there will likely be an increase in demand for California beachfront hotels.
14. These are complements, so there will be an increase in demand for covers.
15. Cars and gasoline are complements. People tend to still buy cars when the price of gasoline increases, but they are more likely to buy cars with better fuel efficiency when the price of gas is high.
16. There likely will be a change in preferences leading to an increase in demand for blue sweaters.
17. There will be a change in preferences leading to an increase in demand. However, the supply is perfectly inelastic (once the tickets are sold out, there is no way to produce more).
18. There will be a change in preferences causing an increase in demand for apples. In the short run (next week), the supply curve is perfectly inelastic. In the long run, after a few years have passed, the apple orchardists can plant more apple trees and there is an increase in supply.
19. Most people in Seattle don't purchase residential air conditioning, regardless of the price. (There aren't enough hot days to make it worthwhile). In Arizona, the demand for residential air conditioning likely is fairly inelastic.

20. 50 years ago there were not any very good substitutes for landline phones. Now cellphones provide good substitutes.
21. The demand for strollers is largely determined by demographics. There were lots of babies during the “baby boom” between 1946 and 1964, and after a period of fewer babies there again were more babies.
22. Describe an example of a product where an increase in income causes people to buy less of that product, because they are buying something better instead.
23. The tax causes the supply curve to shift up (which means a decrease in supply). The demand for coffee might be fairly inelastic.
24. There likely are good substitutes for the pumpkin spice lattes, so the demand is likely fairly elastic.

Part C

25. The difference in the two prices is

$$130 - 124 = 6$$

The midpoint (average) price is:

$$\frac{124 + 130}{2} = \frac{254}{2} = 127$$

The difference in the two quantities is

$$44 - 48 = 4$$

The midpoint (average) quantity is:

$$\frac{48 + 44}{2} = \frac{92}{2} = 46$$

The elasticity is:

$$\frac{\frac{4}{46}}{\frac{6}{127}} = \frac{4 \times 127}{46 \times 6} = 1.8406 \text{ round to } 1.841$$

Or you could calculate it like this:

$$\frac{\frac{4}{\frac{46}{6}}}{\frac{6}{127}} = \frac{0.0870}{0.0472} = 1.841$$

Calculate the revenue at the two points on the demand curve:

$$124 \times 48 = 5,952; \quad 130 \times 44 = 5,720$$

The elasticity (1.8406) is greater than one, which means that the revenue is higher at the point with the lower price.

26.

$$542 - 523 = 19; \quad \frac{523 + 542}{2} = \frac{1,065}{2} = 532.5$$

$$497 - 1,200 = 703; \quad \frac{1,200 + 497}{2} = \frac{1,697}{2} = 848.5$$

The elasticity is:

$$\frac{\frac{703}{848.5}}{\frac{19}{532.5}} = \frac{703 \times 532.5}{848.5 \times 19} = 23.2204 \text{ round to } 23.220$$

revenue point 1 = $523 \times 1,200 = 627,600$; revenue point 2 = $542 \times 497 = 269,374$

The elasticity (23.2204) is greater than one, which means that the revenue is higher at the point with the lower price.

27. The elasticity is:

$$\frac{\frac{1,200 - 1,180}{\frac{1,200 + 1,180}{2}}}{\frac{542 - 520}{\frac{542 + 520}{2}}} = \frac{\frac{20}{1,190}}{\frac{22}{531}} = \frac{20 \times 531}{1,190 \times 22} = 0.406$$

revenue point 1 = $520 \times 1,200 = 624,000$; revenue point 2 = $542 \times 1,180 = 639,560$

The elasticity (0.4057) is less than one, which means that the revenue is higher at the point with the higher price.

28. The elasticity is:

$$\frac{\frac{24}{84}}{\frac{12}{42}} = \frac{24 \times 42}{84 \times 12} = 1$$

revenue point 1 = $36 \times 96 = 3,456$; revenue point 2 = $48 \times 72 = 3,456$

The elasticity is one, which means that the revenue is the same.

29. Elasticity: 0.689; Revenue:

$$64 \times 138 = 8,832$$

$$60 \times 132 = 7,920$$

The elasticity is less than one, which means that the revenue is higher at the point with the higher price.

30. Elasticity: 4.996; Revenue:

$$67 \times 75 = 5,025$$

$$60 \times 132 = 7,920$$

The elasticity is greater than one, which means that the revenue is higher at the point with the lower price.

31. Elasticity: 2.640; Revenue: 1,173 and 1,296. The elasticity is greater than one, which means that the revenue is higher at the point with the lower price.

32. Elasticity: 1.792; Revenue: 7,880 and 8,976. The elasticity is greater than one, which means that the revenue is higher at the point with the lower price.

33. Elasticity: 0.940; Revenue: 96,460 and 96,000. The elasticity is less than one, which means that the revenue is higher at the point with the higher price.

34. Elasticity: 0.069; Revenue: 46,516 and 34,440. The elasticity is less than one, which means that the revenue is higher at the point with the higher price.