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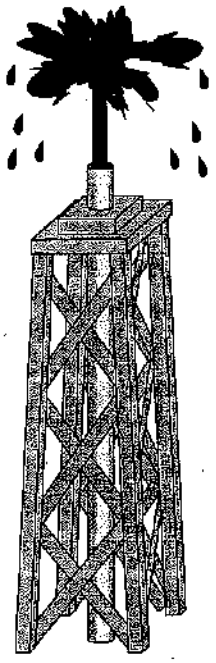
ECONOMICS LABORATORY 2

LEARNING FROM SUPPLY AND DEMAND CURVES



Businesses and governments must keep a constant watch on factors that influence supply and demand. Even slight changes in supply or demand for a good may signal a need for a price adjustment or policy change. One of the most significant products that is subject to such change is crude oil. That is because demand for crude oil is strong, especially in industrial nations, and because political events may cause big changes in supply. This lab will help you build models to understand how the demand for oil and supply of oil operate. (The figures below do not duplicate, but only approximate, world conditions.)

Instructions: *You may do this lab by yourself. However, with the teacher's permission, you may want to have a partner or two work together with you to complete the lab. You will need pencils or pens of two different colors, some paper, and your textbook. A calculator would also help you do the math.*

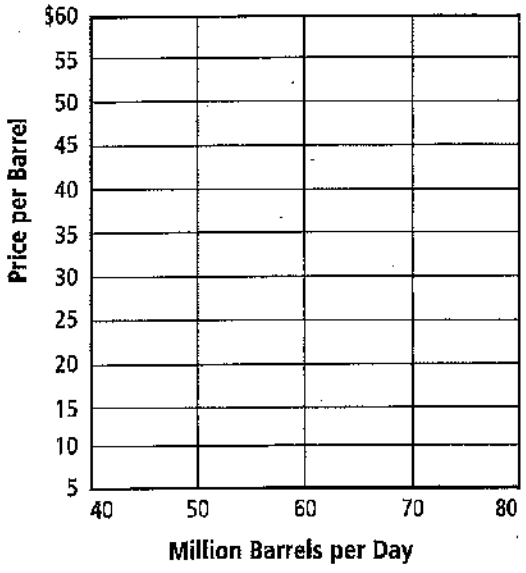
STEP 1. GRAPHING DEMAND

Remember that price and demand have an inverse relationship. As the price rises, demand falls. Use the information in Figure 1 to graph daily demand for crude oil on Figure 2 below. First, place a dot at each point on the graph to represent how many million barrels would be demanded at each price listed on the left. Then connect the dots.

Figure 1. World Demand for Crude Oil

Price per Barrel	Quantity Demanded (million barrels per day)
$5	72
$10	67
$15	62
$20	58
$25	56
$30	54
$35	52
$40	49
$45	48
$50	48
$55	47
$60	47

Figure 2. Daily Demand for Crude Oil



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Answer the following questions.

1. Compare your graph to graphs of demand in your text. Is demand for crude oil relatively elastic or inelastic? Why do you think demand for crude oil is relatively (elastic, inelastic)?

_____

_____

2. Demand for crude oil is more elastic at some price ranges than at others. Check your World Demand for Crude Oil table. At what price ranges is demand more elastic? Why might this be?

_____

_____

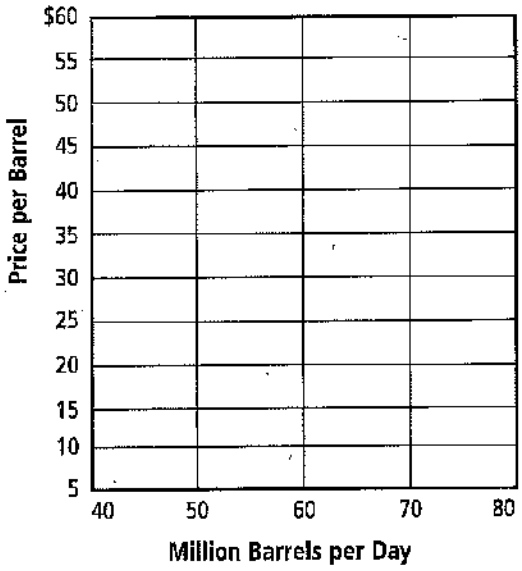
STEP 2. GRAPHING SUPPLY

Supply and price have a direct relationship. As the price rises, supply also rises. Use the information in Figure 3 to graph daily supply for crude oil on Figure 4. First, place a dot at each point on the graph to represent how many million barrels would be supplied at each price listed on the left. Then connect the dots.

Figure 3. World Supply of Crude Oil

Price per Barrel	Quantity Supplied (million barrels per day)
$5	40
$10	47
$15	52
$20	56
$25	60
$30	63
$35	66
$40	69
$45	72
$50	75
$55	78
$60	80

Figure 4. Daily Supply of Crude Oil



Answer the following questions.

3. How does the graph show the direct relationship between quantity supplied and price?

_____

_____

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4. Compare the change in quantity supplied when the price drops from $10 to $5 to the change in quantity supplied when the price drops from $60 to $55. What factor regarding the production of crude oil may account for this difference?

_____

_____

STEP 3. SUPPLY AND THE PROFIT INCENTIVE

Locating and drilling for oil is expensive. The price a company charges must cover all the costs and give a profit. Also remember the law of diminishing returns: at some point the output for each additional unit of production input will begin to decrease. Finally, the cost of producing one barrel of crude oil varies greatly throughout the world. Look at Figure 5. Then answer the questions below.

Figure 5. Costs of Producing Crude Oil

Area	Cost per Barrel
Gulf of Mexico	$10
North Sea	$11
Siberia (Russia)	$14
Venezuela	$7
Middle East	$2
Indonesia	$6
Nigeria	$7

5. What areas would not make a profit when the price of crude oil is below $10?

_____

_____

6. Russia produced about 6.9 million barrels of crude oil per day in 1998. How would a world market price of $12 per barrel affect the Russian economy?

_____

_____

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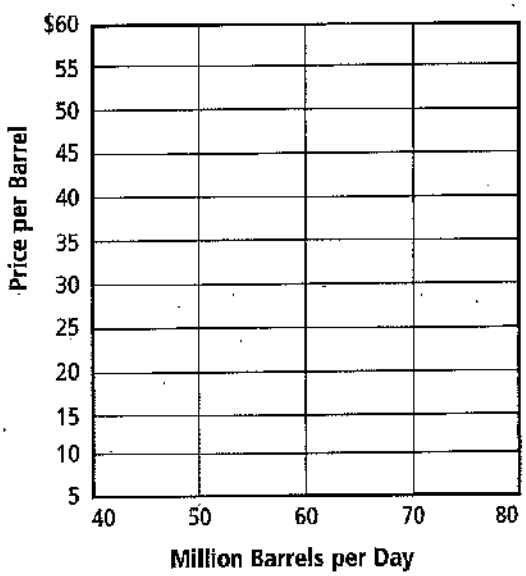
STEP 4. FINDING EQUILIBRIUM

The equilibrium price is where the demand and supply curves intersect. Find out the equilibrium price of crude oil in this model by plotting both demand and supply on the Figure 6 graph. (Use the statistics in Figures 1 and 3 and colored pens or pencils.) Label the demand curve with a "D" at each end. Label the supply curve with an "S" at each end.

Figure 6. Model of the Crude Oil Market



Answer the following questions.

7. At approximately what dollar amount do the demand and supply curves intersect? _____

8. About how many barrels of oil would be produced per day at the equilibrium price? _____

STEP 4. SURPLUS

Notice the area above and below the point where the demand curve and supply curve intersect. At any price above the equilibrium price there will be a surplus of oil. At any price below the equilibrium price, there will be a shortage of oil. Why is this so? Because at prices above equilibrium, producers will produce more than the amount the market demands. At prices below equilibrium, consumers will demand more than producers are willing to supply.

On your graph, label the area above the equilibrium price intersection "surplus." Label the area below the intersection "shortage."

Answer the following questions.

9. In what two ways could producers react to reduce a surplus of crude oil?

_____

_____

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10. What unexpected factors could cause a temporary surplus or shortage of crude oil?

_____

_____

STEP 5. ELASTICITY

Elasticity is a measure of responsiveness to a change in price. If demand is elastic, a relatively small change in price creates a large change in demand. The same is true for supply—a small price change causes a larger change in output. Inelastic demand and supply mean that a change in price has little effect on the quantity supplied or demanded. One way to measure elasticity is by a total receipts test. This test may show that a slightly lower price will actually increase total receipts for sales because demand is elastic. On the other hand it may show that a lower price causes only a small increase in sales—not enough to increase total receipts (inelastic demand). Complete the test below by filling in the blanks.

Figure 7. Total Receipts Test for Crude Oil: *Multiply the price by the quantity sold.*

48 m barrels × $60 = $_____ million
50 m barrels × $55 = $_____
52 m barrels × $50 = $_____
53 m barrels × $45 = $_____
54 m barrels × $40 = $_____
55 m barrels × $35 = $_____
56 m barrels × $30 = $_____
57 m barrels × $25 = $_____
58 m barrels × $20 = $_____
60 m barrels × $15 = $_____
63 m barrels × $10 = $_____
67 m barrels × $5 = $_____

Answer the following questions.

11. Does a decrease in price at any point on the table cause an increase in receipts? _____

12. Does this test show demand for oil to be elastic or inelastic? _____