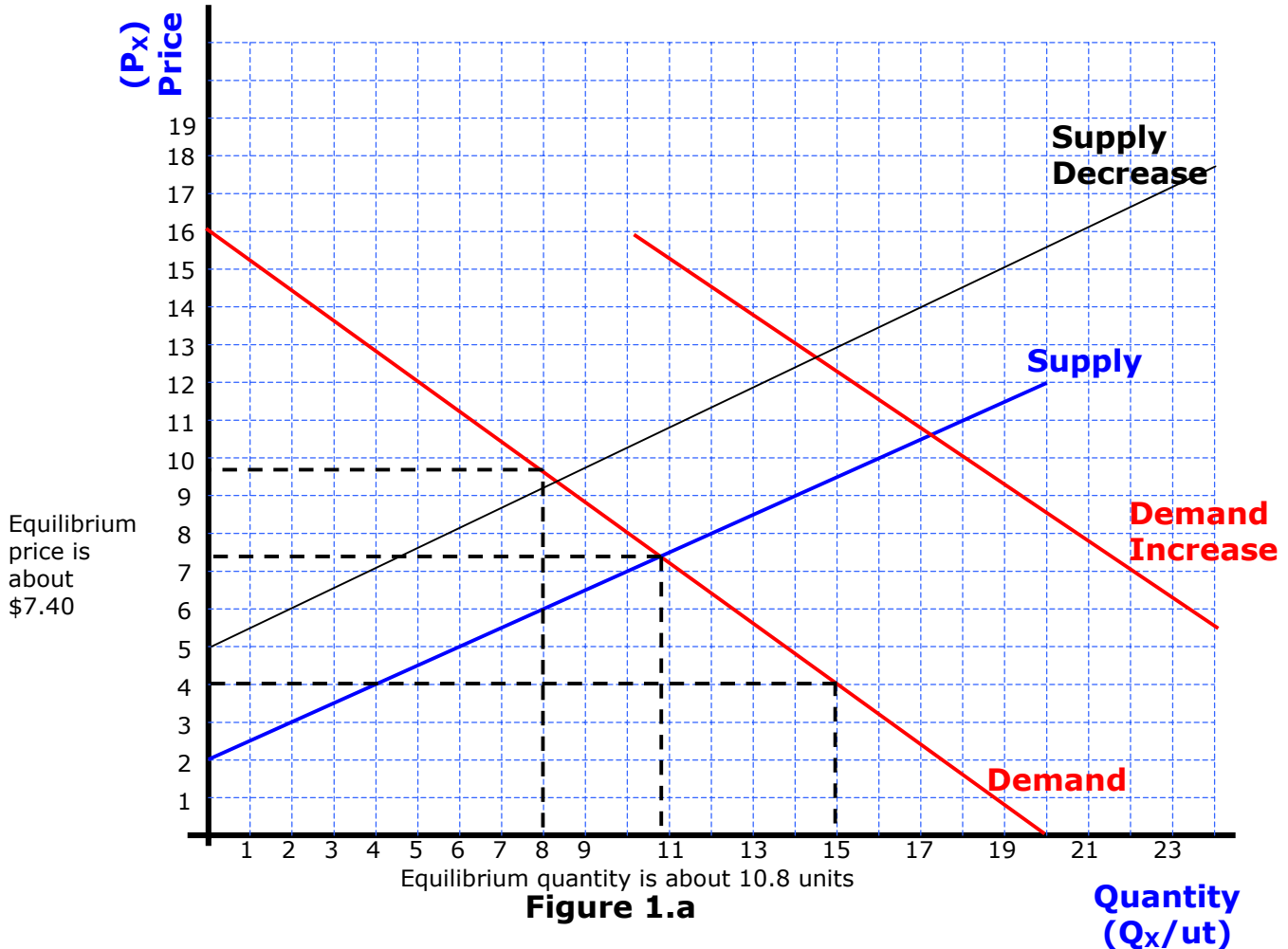


DEMAND, SUPPLY AND EQUILIBRIUM

In a hypothetical market, the buyers will take 20 units of good X if the goods are "free." The marketing department estimates that for each \$1 increase in the price of the good, the buyers will reduce their purchases by 1.25 units of the good. Construct the demand function on the graph provided. Complete the table that shows the demand schedule.



1. What is the equation that represents the quantity demanded as a function of price?

$$Q_d = f(P), \quad Q_d = 20 - 1.25P$$

2. What is the equation that represents the price as a function of the quantity?

$$P = f(Q_d), \quad P = 16 - .8Q_d$$

3. When the Price is \$4 what is the Quantity demanded? $Q_d = 20 - 1.25(4) = 15 \text{ units}$

4. What is the maximum price that someone is willing and able to pay for the 8th unit of the good? $P = 16 - .8(8) = \$9.60$

The sellers will not offer any of good X at or below a price of \$2. For each additional dollar the price increases they will offer 2 additional units for sale.

5. What is the supply equation?

$$\text{Cost} = P = f(Q_s) \quad P = 2 + .5Q_s \text{ or } Q_s = -4 + 2P$$

6. Construct the supply equation on the graph and complete the schedule in the Table.

7. Using the graph, what is the approximate equilibrium price? **About \$7.40**

8. Using the graph what is the approximate equilibrium quantity? **About 10.8 units**

9. What is the equilibrium quantity and price when calculated by using the supply and demand equations?

Quantity supplied = Quantity demanded
 $Q_s = -4 + 2P = 20 - 1.25P = Q_d$
 $3.25P = 24$
 $P = 24/3.25 = \$7.385$ (equilibrium Price)

$2 + .5Q = 16 - .8Q$
 $1.3Q = 14$
 $Q = 14/1.3 = 10.769$ units

10. What happens if the demand should increase (decrease)? *More is purchased at each possible price; A higher price will be paid for each unit of the good.*

Show an increase (decrease) in demand on the graph? *See "Demand Increase" in Figure 1.*

11. What happens to equilibrium price and quantity when demand increases (decreases)? *Both equilibrium price and quantity would increase (decrease)*

12. Show a decrease (increase) in supply. *See "Supply Decrease" in Figure 1*

13. What happens to equilibrium price and quantity when the supply decreases? *Equilibrium price will increase while equilibrium quantity will decrease.*

14. What happens when demand increases and supply decreases? *Equilibrium price must necessarily increase but the change in equilibrium quantity will depend on the magnitude of the shifts and the relative elasticities of supply and demand.*

Demand & Supply		
Price (P _x)	Quantity X Demanded (Q _D)	Quantity X Supplied (Q _S)
\$20	$Q_d = 20 - 1.25P$ $P = 16 - .8Q_d$	$Q_s = (-4) + 2P$ $P = 2 + .5Q_s$
\$19		
\$18		
\$17		
\$16	0.00	28.00
\$15	1.25	26.00
\$14	2.50	24.00
\$13	3.75	22.00
\$12	5.00	20.00
\$11	6.25	18.00
\$10	7.50	16.00
\$9	8.75	14.00
\$8	10.00	12.00
\$7	11.25	10.00
\$6	12.50	8.00
\$5	13.75	6.00
\$4	15.00	4.00
\$3	16.25	2.00
\$2	17.50	0.00
\$1	18.75	-2.00
\$0	20.00	-4.00

The supply and demand functions intersect between these two rows, the "quantity supplied" will equal the "quantity demanded"

