

1. Let the demand and supply functions be represented by $D(p)$ and $S(p)$, where p is the price in dollars.

$$D(p) = 3888 - 40p$$

$$S(p) = 230p - 972$$

- A. Find the price when the demand is 2000. Is there a surplus or a shortage at this price?
 B. Find the equilibrium price and demand (supply) for the given functions.
 C. At what prices is there a shortage?
 D. At what prices is there a surplus?

2. Let the demand and supply functions be represented by $D(p)$ and $S(p)$, where p is the price in dollars.

$$D(p) = 2784 - 60p$$

$$S(p) = 230p - 6962$$

- A. Find the price when the demand is 2500. Is there a surplus or a shortage at this price?
 B. Find the equilibrium price and demand (supply) for the given functions.
 C. At what prices is there a shortage?
 D. At what prices is there a surplus?

3. Let the demand and supply functions be represented by $D(p)$ and $S(p)$, where p is the price in dollars.

$$D(p) = 189,200 - 250p$$

$$S(p) = 610p$$

- A. Find the price when the demand is 140,000. Is there a surplus or a shortage at this price?
 B. Find the equilibrium price and demand (supply) for the given functions.
 C. At what prices is there a shortage?
 D. At what prices is there a surplus?

SOLUTIONS:

1. A. $3888 - 40p = 2000 \quad \rightarrow -40p = -1888 \quad \rightarrow p = 47.2$
 $S(47.2) = 230(47.2) - 972 = 9884$ greater than the demand of 2000, so there is a surplus.
- B. $3888 - 40p = 230p - 972 \rightarrow 4860 = 270p \rightarrow p = 18$
 $\$18$, with a demand of 3168 ($3888 - 40(18) = 3168$)
- C. $p < \$18$, if the price is lower than the equilibrium price, then supply < demand.
- D. $p > \$18$, if the price is greater than the equilibrium price, then the supply > demand.
2. A. $2784 - 60p = 2500 \quad \rightarrow -60p = -284 \quad \rightarrow p = 4.73$

$S(4.73) = 230(4.73) - 696 = 391.9$ less than the demand of 2500, so there is a shortage.

- B. $2784 - 60p = 230p - 696 \rightarrow 3480 = 290p \rightarrow p = 12$
\$12, with a demand of 2064 ($2784 - 60(12) = 2064$)
- C. $p < \$12$, if the price is lower than the equilibrium price, then supply < demand.
- D. $p > \$12$, if the price is greater than the equilibrium price, then the supply > demand.
3. A. $189,200 - 250p = 140,000 \rightarrow -250p = -49,200 \rightarrow p = 196.8$
 $S(196.8) = 610(196.8) = 120,048$ less than the demand of 140,000, so there is a shortage.
- B. $189,200 - 250p = 610p \rightarrow 189,200 = 860p \rightarrow p = 220$
\$220, with a demand of 134,200 ($189,200 - 250(220) = 134,200$)
- C. $p < \$220$, if the price is lower than the equilibrium price, then supply < demand.
- D. $p > \$220$, if the price is greater than the equilibrium price, then the supply > demand.