Finite Mathematics (Fall 2008) – Solutions to Quiz 2

Version 1

1. (6) When the price of a can of Cougar Gold cheese is p dollars, the supply from WSU Creamery is $2p^2 - 3p$ cans, and the demand is $108 + p^2$ cans. At what value of p will the market for Cougar Gold cheese be in equlibrium, i.e., when the supply and demand are equal?

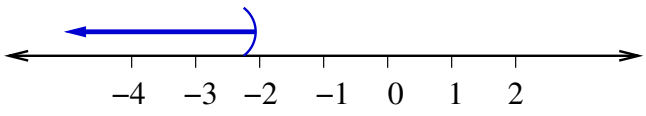
$$\begin{aligned} \text{supply} &= \text{demand} \\ 2p^2 - 3p &= 108 + p^2 \\ 2p^2 - p^2 - 3p - 108 &= 0 \\ p^2 - 3p - 108 &= 0 \\ (p-12)(p+9) &= 0, \quad \text{So, } p = 12,\ p = -9. \end{aligned}$$

Since p is the price of a can of cheese, it cannot be negative. Hence the market is in equilibrium when the price of a can of cheese is \$12.

2. (5) Solve the following inequality. Give your answer in interval notation, and indicate the answer geometrically on the real number line. $\frac{y}{4} - \frac{y}{3} > y + \frac{13}{6}$

$$\begin{aligned} 12\,\frac{y}{4} - 12\,\frac{y}{3} &> 12\,y + 12\,\frac{13}{6} \\ 3y - 4y &> 12y + 26 \\ -y - 12y &> 26 \\ \left(\frac{-1}{13}\right) - 13y &> \left(\frac{-1}{13}\right) 26 \\ y &< -2 \end{aligned}$$

The solution set is $(-\infty, -2)$.



Version 2

1. (6) When the price of a can of Cougar Gold cheese is p dollars, the supply from WSU Creamery is $3p^2 - 5p$ cans, and the demand is $104 + 2p^2$ cans. At what value of p will the market for Cougar Gold cheese be in equlibrium, i.e., when the supply and demand are equal?

$$\begin{aligned} \text{supply} &= \text{demand} \\ 3p^2 - 5p &= 104 + 2p^2 \\ 3p^2 - 2p^2 - 5p - 104 &= 0 \\ p^2 - 5p - 104 &= 0 \\ (p-13)(p+8) &= 0, \quad \text{So, } p = 13,\ p = -8. \end{aligned}$$

Since p is the price of a can of cheese, it cannot be negative. Hence the market is in equilibrium when the price of a can of cheese is \$13.

2. (5) Solve the following inequality. Give your answer in interval notation, and indicate the answer geometrically on the real number line. $\dfrac{y}{3} - \dfrac{y}{4} < y + \dfrac{11}{6}$

$$\begin{aligned} 12\frac{y}{3} - 12\frac{y}{4} &< 12\,y + 12\frac{11}{6} \\ 4y - 3y &< 12y + 22 \\ y - 12y &< 22 \\ \left(\frac{-1}{11}\right) - 11y &< \left(\frac{-1}{11}\right) 22 \\ y &> -2 \end{aligned}$$

The solution set is $(-2, +\infty)$.