1. Suppose the market for concert tickets at the Hayden Homes Amphitheater is represented by the following supply and demand equations.

$$Q_s = 9P - 400 \quad \text{and} \quad Q_D = 1000 - 5P$$

Find each of the following:

a.) Equilibrium price

$$9P - 400 = 1000 - 5P$$
$$14P = 1400$$
$$P = 100$$

b.) Equilibrium quantity

$$Q_s = 9 * 100 - 400 \qquad Q_d = 1000 - 5 * 100$$
$$Q_s = 500 \qquad Q_d = 500$$

2. Suppose the venue fixes the price of tickets at $90. Find each of the following:

a.) New quantity supplied

$$Q_s = 9 * 90 - 400 = 410$$

b.) New quantity demanded

$$Q_d = 1000 - 5 * 90 = 550$$

c.) The price people are willing to pay given the new quantity supplied

$$410 = 1000 - 5*P$$
$$5 * P = 590$$
$$P = 118$$

d.) Is this a price floor or price ceiling? Price ceiling

3. Identify the type and find the Marginal Rate of Substitution (MRS) for the following utility functions:

a.) $U(x_1, x_2) = x_1^{.3} x_2^{.7}$ Cobb-Douglas

$$\frac{MU_{x_1}}{MU_{x_2}} = \frac{.3x_1^{-.7}x_2^{.7}}{.7x_1^{.3}x_2^{-.3}} = \frac{.3x_2}{.7x_1}$$

b.) $U(x_1, x_2) = \min\{2x_1, 3x_2\}$ Perfect Compliments

$$\frac{MU_{x_1}}{MU_{x_2}}$$

c.) $U(x_1, x_2) = 2x_1 + x_2$ Perfect Substitutes

$$\frac{MU_{x_1}}{MU_{x_2}} = \frac{2}{1} = 2$$

d.) $U(x_1, x_2) = 2\ln(x_1) + 3x_2$ Quasi-Linear

$$\frac{MU_{x_1}}{MU_{x_2}} = \frac{2/x_1}{3} = \frac{2}{3x_1}$$

4. Suppose an individual's utility for good x is described by the following table. Fill out the columns for marginal benefit and marginal cost. What quantity of good x should the individual consume? What is the utility at this quantity?

Quantity	Benefit	Marginal Benefit	Marginal Cost
1	10	10	5
2	17	7	5
3	22	5	5
4	24	2	5
5	25	1	5

MB=MC ⟹ Consume at Q=3.

Utility=22-3*5=7.