Question 1 If he gives up 9 sodas he gets 3 pizzas. Thus, he get 3 sodas per pizza. Therefore,

**the price of a soda is 2 Dollars**

Question 2 For every unit of good 1 she can acquire 2 units of good 2. Therefore,

**She can afford 40 units of good 2**

Question 3

- (0, 12),
- (2, 8),
- (6, 3),
- (12, 0),

Graph the indifference curve in the grid below and shade that set of all consumption choices that are strictly better than (4, 4).

![Graph of indifference curve](image)

Question 4 The partial derivatives are given by $1/\sqrt{x_1}$ and 1. The MRS is therefore $-1/\sqrt{x_1}$. Therefore,

**MRS(16, 4) = $-\frac{1}{4}$**
Question 5 If $x_2 = 10$ then $x_1 = 5$. Therefore, the income is $5p_1 + 10p_2$, i.e.,

$$m = 50$$

Question 6 The optimal choice is interior. Therefore, $p_1/p_2 = 1/3$.

$$p_2 = 36$$

Question 7 Again, the optimal choice is interior. Therefore,

$$\text{MRS}(3, 7) = -\frac{1}{2}$$

Question 8

![Graph showing demand for goods 1 and 2 with a budget line]

**demand for good 1 changes by 1 unit**

**demand for good 2 changes by $-2$ units**

Question 9 At the optimal choice $\text{MRS}(x_1, x_2) = -\frac{4}{x_1+x_2+4} = -\frac{1}{4}$, which implies $16 = x_1 + x_2 + 4$, i.e., $x_1 + x_2 = 12$. The budget line equation is $x_1 + 4x_2 = 42$. Therefore,

$$x_1 = 2 \quad x_2 = 10$$
Question 10

At the optimal choice $x_1 = 8$  $x_2 = 4$

Question 11  The MRS is $-\left(17 - 2h\right)$. If the price of an hour of calls is 5 then $17 - 2h = 5$. Therefore $h = 6$.

The utility of not signing up is $u(0, 1000) = 1,000$. For 6 hours of calls the person pays 30 Dollars. In addition he/she pays $F$. Therefore, $u(6, 1000 - 30 - F) = 1,000$, i.e., $1,036 - F = 1,000$. Therefore, $F$ can be at most 36.

If the consumer signs up, he/she will call $h = 6$ hours

The company will select $F = 36$ as fixed fee
Question 12

good 2

good 1