Question 1

Consider again the original budget line depicted above. Suppose that income is

\[ I = 160. \]

Then \( p_1 = 8, \ p_2 = 16 \)

4 points

Question 2  Preferences are indicated below by indifference curves
1. Circle the correct statements

\[
(18, 15) \geq (5, 5) \quad (14, 10) \succ (10, 14) \quad (24, 0) \geq (0, 24)
\]

\[
(24, 0) \geq (0, 20) \quad (6, 2) \succ (0, 10) \quad (7, 12) \succ (12, 7)
\]

2. Answer the following questions

\[
\text{MRS}(12, 18) = 1
\]

\[
\text{MRS}(2, 14) = 3
\]

4 points

3. Suppose that \((12, 4)\) is the optimal consumption choice. Thus, the \(\text{MRS} = 1/3 = p_1/p_2\). Since \(p_1 = 12\), we get

\[
p_2 = 36 \text{ and income is } I = 288
\]

4 points
Question 3

The bank should choose $x_S = 10, x_L = 30$

The bank’s profit (value of objective is 4 (million) Dollars)

12 points

Question 4

The solution is $x_1 = 12, x_2 = 3$

12 points
Question 5

At the optimal choice $x_1 = 6 \, x_2 = 15$
Question 6 \( \epsilon^S_P = P/(20 + P) \). Thus,

The price elasticity of supply at \( P = 10 \) is \( \epsilon^S_P = 1/3 \)

\( \epsilon^S_P = -4P/(120 - 4P) = 1 \) implies \( 4P = 120 - 4P \). Thus,

Demand is unit elastic, i.e., \( \epsilon^D_P = 1 \), at \( P = 15 \)

In equilibrium \( 120 - 4P = 20 + P \). Thus,

\( P^* = 20, Q^* = 40 \)

Question 7
(a) Price of steel decreases and demand increases.  

(b) Since the price of an input decreases, supply will shift to the right. Price for cars will decrease and demand increases.

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**Question 8**

(a) When \( P = 200 \) demand is 130,000. Thus, excess demand is 80,000.

(b) The equilibrium price is given by \( Q_D(P^*) = 50,000 \). Thus, \( P^* = 1,000 \).

Therefore, your expected profit (revenue - cost) is 800.

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**Question 9 (b) and (c) are linear**

List all constraints that are slack: (1), (2)