REVIEW 8.1 (U.S. IMPORT DEMAND)
US demand is $P = 48 - 2Q$, and US supply is $P = 16 + 2Q$.

1. Derive the U.S. autarky price.

2. Derive U.S. import demand.

REVIEW 8.2 (MEXICAN EXPORT SUPPLY & WORLD EQUILIBRIUM) Mexican demand is $P^* = 32 - 2Q^*$, and Mexican supply is $P^* = 2Q^*$.

1. Determine the Mexican autarky price.

2. Derive Mexican export supply.

3. Derive the world price under free trade.

4. Derive US imports under free trade.

5. Derive Mexican exports under free trade.

6. Derive the US quantity demanded and quantity supplied under free trade.

REVIEW 8-3 (US IMPORT TARIFF)
Suppose the United States now places a specific tariff $t = 8$.

1. Derive the tariff-ridden US import demand.

2. Derive the tariff-ridden Mexican price.

3. Derive the tariff-ridden US price.

4. Derive the tariff-ridden volume of trade (imports or exports).

5. Derive the tariff-ridden US quantity demanded and quantity supplied.

REVIEW 8-4 (US WELFARE)

1. Derive the change in US producer surplus due to the tariff.

2. Derive the change in US consumer surplus due to the tariff.

3. Derive the change in US government revenue due to the tariff.

4. Derive the change in US welfare due to the tariff.

5. Derive the production distortion, consumption distortion, efficiency loss, and TOT effect for the United States.

REVIEW 8.1 SOLUTIONS (US IMPORT DEMAND)
US demand is P = 48 - 2Q, and US supply is P = 16 + 2Q.

1. Derive the US autarky price.
   The US autarky price equates US demand and US supply.

$$48 - 2Q^A = 16 + 2Q^A$$

$$4Q^A = 32 \rightarrow Q^A = \frac{32}{4} = 8$$

$$P^A = 48 - 2Q^A = 48 - 2(8) = 48 - 16 = 32$$

2. Derive US import demand.
   US import demand is the amount that quantity demand exceeds quantity supplied for various prices.

$$P = 48 - 2Q \rightarrow Q_D = 24 - \frac{1}{2}P$$

$$P = 16 + 2Q \rightarrow Q_S = -8 + \frac{1}{2}P$$

$$M = Q_D - Q_S = 24 - \frac{1}{2}P - \left(-8 + \frac{1}{2}P \right)$$

$$M = 32 - P \rightarrow P = 32 - Q_M$$

REVIEW 8.2 SOLUTIONS (MEXICAN EXPORT SUPPLY & WORLD EQUILIBRIUM) Mexican demand is $P^* = 32 - 2Q^*$, and Mexican supply is $P^* = 2Q^*$.

1. Derive the Mexican autarky price.
   Mexican autarkic price equates Mexican demand and Mexican supply.

$$32 - 2Q^{A*} = 2Q^{A*}$$

$$4Q^{A*} = 32 \rightarrow Q^{A*} = \frac{32}{4} = 8$$

$$P^* = 32 - 2Q^{A*} = 32 - 2(8) = 32 - 16 = 16$$

2. Derive Mexican export supply.
   Mexican export supply is the amount that supply exceeds demand for various prices.

$$P^* = 32 - 2Q^* \rightarrow Q_D^* = 16 - \frac{1}{2}P^*$$

$$P^* = 2Q^* \rightarrow Q_S^* = \frac{1}{2}P^*$$

$$X^* = Q_S^* - Q_D^* = \frac{1}{2}P - \left(16 - \frac{1}{2}P\right)$$

$$X^* = -16 + P \rightarrow P = 16 + Q_X^*$$

3. Derive the world price under free trade.
   The world price equates US import demand and Mexican export supply.

$$M = X^* \rightarrow 32 - P = -16 + P$$

$$2P = 48 \rightarrow P = \frac{48}{2} = 24$$

4. Derive US imports under free trade.
   US imports under free trade are

$$M = 32 - P = 32 - 24 = 8$$

5. Derive Mexican exports under free trade.
   Mexican exports under free trade are also

$$X^* = -16 + P = -16 + 24 = 8$$

6. Derive the US quantity demanded and quantity supplied under free trade.

$$P = 48 - 2Q \rightarrow 24 = 48 - 2Q \rightarrow Q = 12 = D^1$$

$$P = 16 + 2Q \rightarrow 24 = 16 + 2Q \rightarrow Q = 4 = S^1$$

REVIEW 8-3 SOLUTIONS (US IMPORT TARIFF)

Suppose the United States now places a specific tariff $t = 8$.

1. Derive the tariff-ridden US import demand.

$$M_T = 32 - P_T = 32 - (P_T^* + t) = 32 - (P_T^* + 8)$$

$$M_T = 24 - P_T^* \rightarrow P_T^* = 24 - Q_M$$

2. Derive the tariff-ridden Mexican price.

$$M_T = X^* \rightarrow 24 - P_T^* = -16 + P_T^*$$

$$2P_T^* = 40 \rightarrow P_T^* = \frac{40}{2} = 20$$

3. Derive the tariff-ridden US price.

$$P_T = P_T^* + t = 20 + 8 = 28$$

4. Derive the tariff-ridden volume of trade (imports or exports).

$$M_T = 24 - P_T^* = 24 - 20 = 4$$

5. Derive the tariff-ridden US quantity demanded and quantity supplied.

$$P_T = 48 - 2Q \rightarrow 28 = 48 - 2Q \rightarrow Q = 10 = D^2$$

$$P_T = 16 + 2Q \rightarrow 28 = 16 + 2Q \rightarrow Q = 6 = S^2$$

REVIEW 8-4 SOLUTIONS (US WELFARE)

1. Derive the change in US producer surplus due to the tariff.

$$\Delta PS = a = (P_T - P)\left(\frac{S^2 + S^1}{2}\right) = (28 - 24)\left(\frac{4 + 6}{2}\right) = 4(5) = 20$$

2. Derive the change in US consumer surplus due to the tariff.

$$\Delta CS = -abcd = -(P_T - P)\left(\frac{D^2 + D^1}{2}\right) = (28 - 24)\left(\frac{12 + 10}{2}\right) = 4(11) = 44$$

3. Derive the change in US government revenue due to the tariff.

$$\Delta GR = ce = t\,M_T = 8(4) = 32$$

4. Derive the change in US welfare due to the tariff.

$$\Delta W = \Delta CS + \Delta PS + \Delta GR = -44 + 20 + 32 = 8$$

5. Derive the production distortion, consumption distortion, efficiency loss, and TOT effect for the United States.

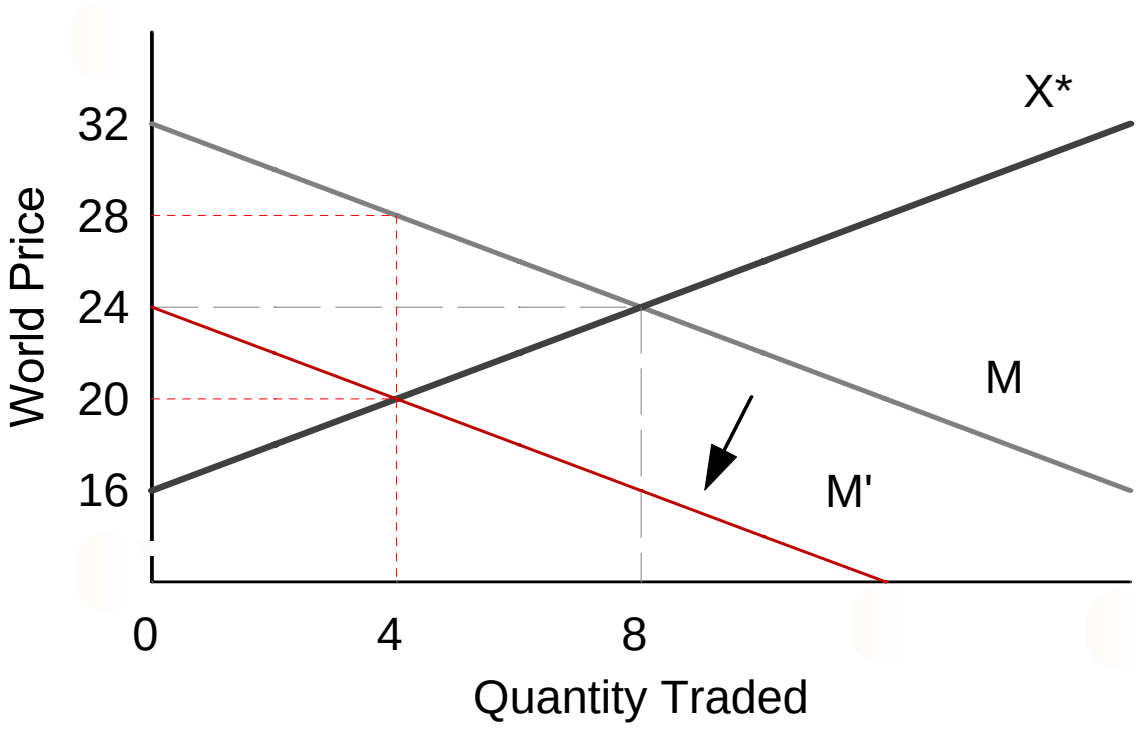
$$b = \frac{(P_T - P)(S^2 - S^1)}{2} = \frac{(28 - 24)(6 - 4)}{2} = 4$$

$$d = \frac{(P_T - P)(D^1 - D^2)}{2} = \frac{(28 - 24)(12 - 10)}{2} = 4$$

$$e = (P - P_T^*)\,M_T^* = (24 - 20)\,4 = 16$$

$$\Delta W = e - (b + d) = 16 - (4 + 4) = 16 - 8 = 8$$

8.4 World Market with U.S.Tariff



8.5 U.S. Market with U.S. Tariff