after 10: 12, 14, 20, 24, 25

9.

Subsidy shifts supply from $S_1$ to $S_2$. Consumer surplus changes from $A + B + D + E + F$ to $C + E + G + B$.

Producer surplus changes from $C + G + B + D$ to $C + E + G + B + D$.

Government expenses change from $A$ to $B + C + D + E + F$.

Equilibrium price without tax is $p = 5$ and quantity is $Q = 50$.

1. Tax: Demand function is $Q = 100 - 100p$ and supply function remains the same.

New equilibrium: $p = 5.5$ and $Q = 45$.

Consumer surplus decreases by $(50 + 45) 	imes 0.5$

Producer surplus decreases by the same amount.

Tax revenue is $4.5$.

$\text{tax} = (23.75 \times 2) - 45 = 2.5$

with price ceiling, equilibrium is $p = 3$

$Q = 30$

Consumer surplus increases by $2 \cdot 30 - 2 \cdot \frac{(50 - 30) \times 0.5}{2}$.
31) equilibrium \( p \) and \( q \) are:

\[ p^* = 6.94 \]
\[ q^* = 6743 \]

Consumer Surplus \[ \int_{0}^{50,000} 50,000 \cdot 0.1p^* dp = 571,059.14 \]

Producer Surplus \[ \int_{0}^{6.94} 0.01 p^* \cdot dp = 9301.048 \]

Chapter 10

12) Yes, they may want to trade. If two individuals consume different bundles and have identical preferences, then MRS may be unequal and may gain by trading.

Ex: U: xy
Person 1 has 4x, 3y
Person 2 has 3x, 4y

by trading 1x for 1y, both can get a utility of 9.

19) a) In absence of trade, the US can produce 30 food and 15 toys. Mexico can produce 10 food and 2 toys.

b) US has comparative advantages in toys and Mexico

\[ \begin{align*}
\text{Food} & \quad \text{US} & \quad \text{Mexico} \\
10 & \quad 30 & \quad 0 \\
5 & \quad 0 & \quad 10 \\
1 & \quad 0 & \quad 2 \\
0 & \quad 15 & \quad 0 \\
\end{align*} \]

e) If US produces 5 food and 12.5 units of food and Mexico produces 10 food, the total goods is greater than when there is no trade.
20) a) MRS is -1 for each person
   b) contract curve is on 45° line

Extra Credit:
24) See equation 10.13
   Note that MRS = \(-\frac{H}{G}\), MRS = \(-\frac{H}{G}\), \(G + G = 100\)
   and \(H + H = 20\)
   equate MRSs and use info about endowments
   we get: \(100G + 100H - H = G = 0\)

Part 2
1) Invisible hand works:
   - interconnected markets, competitive markets
   - general industries
   - specific products, monopolies, oligopolies, isolated markets

2) General Eq:
   good for qualitative understanding, analyzing
   large, interconnected markets
   bad for quantitative analysis, single-market
   analysis, etc.

Partial Eq:
   opposite of general