1. (20 points) A closed economy (NX=0) is characterized by the following equations \( Y = 18 \) billion; \( C = 14.4 \) billion; \( I = 1.8 \) billion; \( T = 1.5 \). Calculate each of the following and clearly identify your answer. **SHOW** your computations.

   a. Government spending
   \[ G = Y - C - I = 18 - 14.4 - 1.8 = 1.8 \text{ billion} \]
   
   b. Private savings
   \[ S_{\text{private}} = Y - T - C = 18 - 1.5 - 14.4 = 2.1 \text{ billion} \]
   
   c. Public savings
   \[ S_{\text{public}} = T - G = 1.5 - 1.8 = -0.3 \text{ billion} \]
   
   d. National savings
   \[ NS = S_{\text{private}} + S_{\text{public}} = 2.1 - 0.3 = 1.8 \text{ billion} \]
   
   e. Government's budget deficit or surplus
   \[ \text{Budget balance} = S_{\text{public}} = -0.3 \text{ billion} \]
   \[ \Rightarrow \text{Budget deficit} = -0.3 \text{ billion} \]

2. (20 points) An open economy is characterized by the following equations

   \( C = 20 + 0.8 \text{ Yd}; I = 100; G = 140; T = 100; NX = -0.1 \text{ Y} \)

   a. Find the equilibrium real GDP, \( Y \).
   \[ \text{Equilibrium:} \quad Y = AE_{\text{planned}} \]
   \[ \Rightarrow Y^* = C + I + G + NX \]
   \[ = 20 + 0.8(Y^* - 100) + 100 + 140 - 0.1Y^* \]
   \[ = 180 + 0.7Y^* \]
   \[ \Rightarrow Y^* = 600 \]