1. **Apartments_a.**

   (a) The key here is that the Engel curve is nonlinear and downward sloping.

   ![Engel Curve Diagram]

   (b) The Engel curve slopes down, so apartments are inferior.

   (c) Previously, spending on apartments was $900 \cdot 95 = $85,500. The new amount needed is $800 \cdot 95 = $76,000, for a difference of $9500. So a lump sum tax on all consumers of $9500 would leave them just able to afford the old point.

2. **AishaMrLee_a.**

   (a)

   
   \[
   MRS_A = -\frac{\partial u}{\partial G} \frac{\partial G}{\partial V} = -0.7G^{-3}V^{-3} \cdot 3G^{-7}V^{-7} = -\frac{7}{3}V = -\frac{7}{3} \cdot 20 = -\frac{7}{6}
   \]

   \[
   MRS_L = -\frac{\partial u}{\partial V} \frac{\partial V}{\partial G} = -0.9G^{-1}V^{-1} \cdot 1G^9V^{-9} = -9 \frac{V}{G} = -9 \cdot 15 = -9
   \]
We have seen before that the demand functions for a Cobb-Douglas will produce the following results:

\[
G_A = 0.7 \frac{m}{p_G} = 0.7 \frac{20 + 10p_V}{1}
\]

\[
G_L = 0.9 \frac{m}{p_G} = 0.9 \frac{15 + 15p_V}{1}
\]

Thus, the market equilibrium condition is:

\[
G_A + G_L = 35
\]

\[
27.5 + 20.5p_V = 35
\]

Solving this gives

\[
20.5p_V = 7.5 \Rightarrow p_V = 0.366
\]

This means that \(G_A = 16.56, G_L = 18.44, V_A = 19.39, V_L = 5.61\).