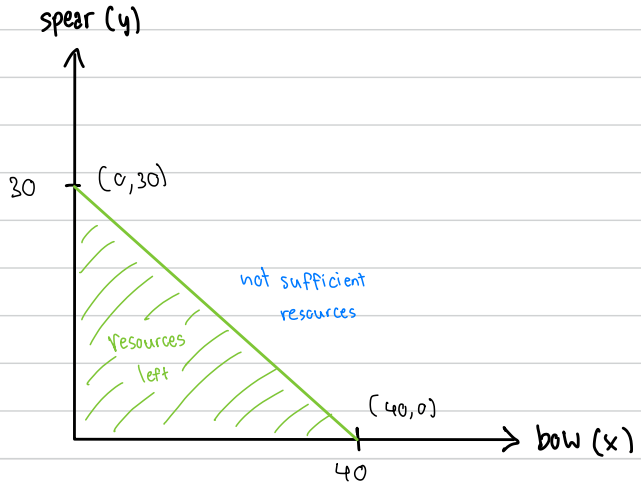
1.a)



Quantities of spear = $\frac{120}{4}$ = 30 spears

Quantities of bow = $\frac{120}{3}$ = 40 bow

The opportunity cost of two products is equal on the line.

1.b) opportunity cost of spear in terms of bow = $\frac{\Delta X}{\Delta Y} = \frac{40-0}{0-30} = \frac{40}{-30} = -\frac{4}{3}$ ✱

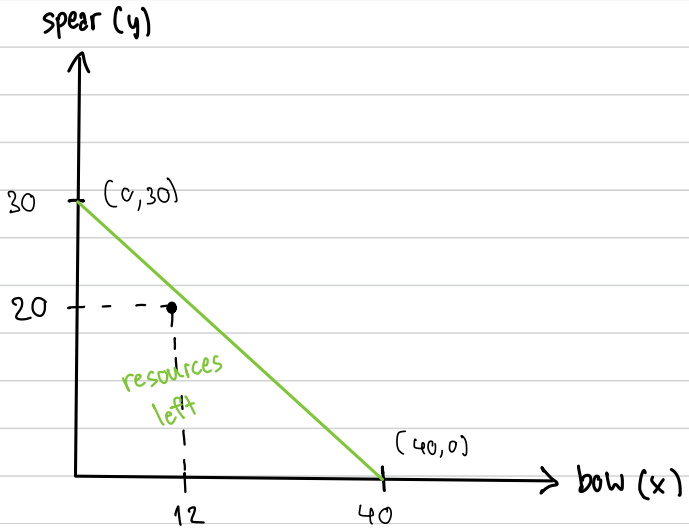
1.c)

20 spears = 20 x 4 = 80 units of wood

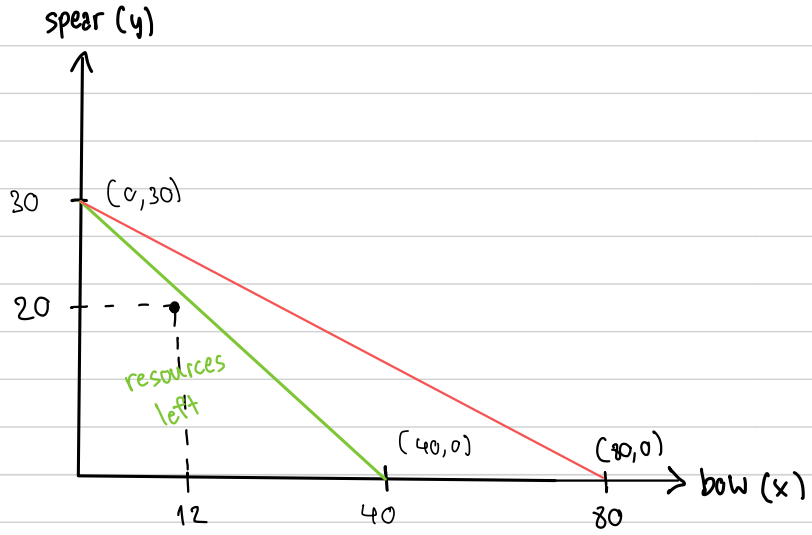
12 bows = 12 x 3 = 36 units of wood

80 + 36 = 116 units of wood

∴ This option is not efficient because it have 4 units left.



1. d)



new method of making bow $\Rightarrow \frac{120}{1.5} = 80$ bows

opportunity cost $= \frac{\Delta x}{\Delta y} = \frac{80-0}{0-30} = -\frac{8}{3}$

2.a) Price elasticity of demand for MRT purple line

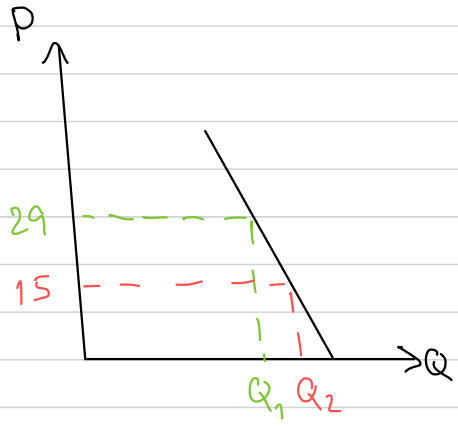
$$\left[\frac{Q_2 - Q_1}{P_2 - P_1}\right]\left[\frac{P_2 + P_1}{Q_2 + Q_1}\right] = \left[\frac{21,000 - 20,000}{29 - 42}\right]\left[\frac{29 + 42}{21,000 + 20,000}\right]$$

$$= \left[\frac{1,000}{-13}\right]\left[\frac{71}{41,000}\right]$$

$$= -\frac{71}{533} \approx -0.133$$

$\therefore$ the price is inelastic demand

2.b)



No because it is inelastic demand, so this strategy will not help increasing the revenue.

3.a) price elasticity of demand $= \left[\frac{Q_2 - Q_1}{P_2 - P_1}\right]\left[\frac{P_1}{Q_1}\right]$

$= \left[\frac{40 - 80}{25 - 20}\right]\left[\frac{20}{80}\right]$

$= \left[\frac{-40}{5}\right]\left[\frac{1}{4}\right] = -2$

price elasticity of supply $= \left[\frac{Q_2 - Q_1}{P_2 - P_1}\right]\left[\frac{P_1}{Q_1}\right]$

$= \left[\frac{80 - 60}{20 - 15}\right]\left[\frac{15}{60}\right]$

$= \left[\frac{5}{\cancel{20}}\right]\left[\frac{1}{\cancel{4}}\right] = 1$

3.b) consumer surplus $= \frac{1}{2} \times 80 \times 100 = 400$

producer surplus $= \frac{1}{2} \times 80 \times 20 = 800$

} TR = 1,200

3.c) consumer surplus $= \frac{1}{2} \times 40 \times 5 = 100$

producer surplus $= (15 \times 40) + \left[\frac{1}{2} \times 40 \times 10\right] = 600 + 200 = 800$

} TR = 900

3.d) deadweight loss $= \frac{1}{2} \times 40 \times 15 = 300$

4.a) Consumer equilibrium

$$MRS = \frac{P_x}{P_y}$$

$$\frac{9}{2} = \frac{P_x}{10}$$

$$P_x = \frac{90}{2} = 45$$

4.b) Consumer equilibrium on point B

$$MRS = \frac{P_x}{P_y}$$

$$\frac{9}{2} = \frac{180}{P_y}$$

$$P_y = \frac{360}{9} = 40$$

At point B = (4, 9)

Budget = $P_x \cdot P + P_y \cdot y$

$= (180 \times 4) + (40 \times 9)$

$= 720 + 360 = 1080$

4.c) Marginal utitity per unit of avocado = $\frac{\Delta U}{\Delta X}$

consumer yields 8 utils on IC_1
12 utils on IC_2

$$MU_C = \frac{12-8}{4-2} = \frac{4}{2} = 2$$

$$MU_D = \frac{12-8}{8-4} = \frac{4}{4} = 1$$

4.d) point A : $X = 2$, $MU_A = 2$
point B : $X = 4$, $MU_B = 1$

point C : $X = 4$, $MU_C = 2$
point D : $X = 8$, $MU_D = 1$

∴ Consume more avocado (X↑) makes the consumer's utility decrease (MU↓)