

Daily Exercise Solution

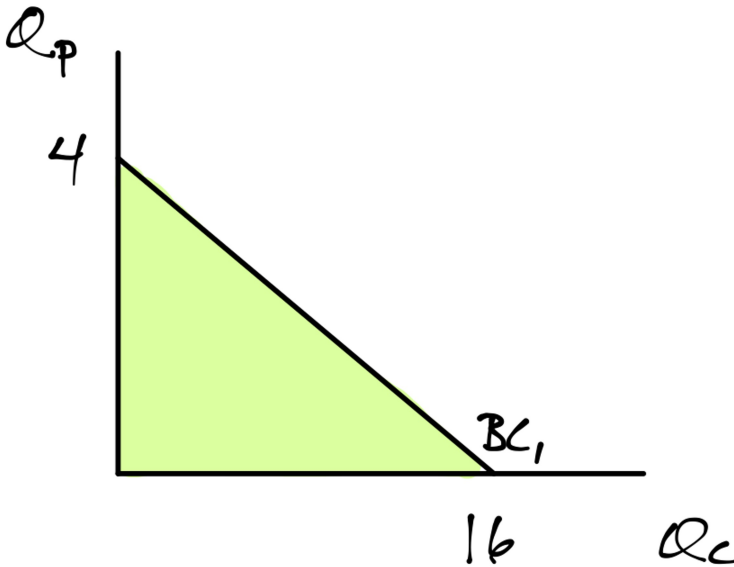
Initial information:

$$M \quad \$48$$

$$P_c \quad \$3$$

$$P_p \quad \$12$$

Initial BC and feasible set:



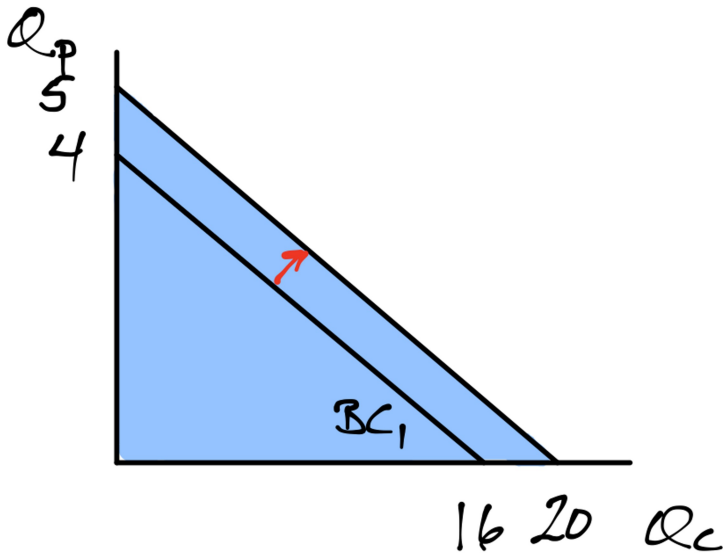
Intercepts and slope:

$$Q_p = \frac{48}{12} = 4$$

$$Q_c = \frac{48}{3} = 16$$

$$m = -\frac{P_c}{P_p} = -\frac{3}{12} = -\frac{1}{4}$$

Revised BC with \$60 to spend:

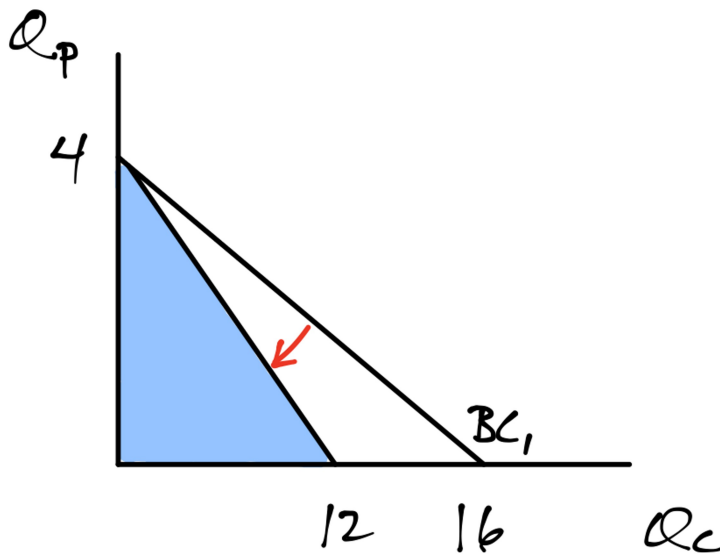


Intercepts:

$$Q_p = \frac{60}{12} = 5$$

$$Q_c = \frac{60}{3} = 20$$

Revised BC with $P_c = \$4$:



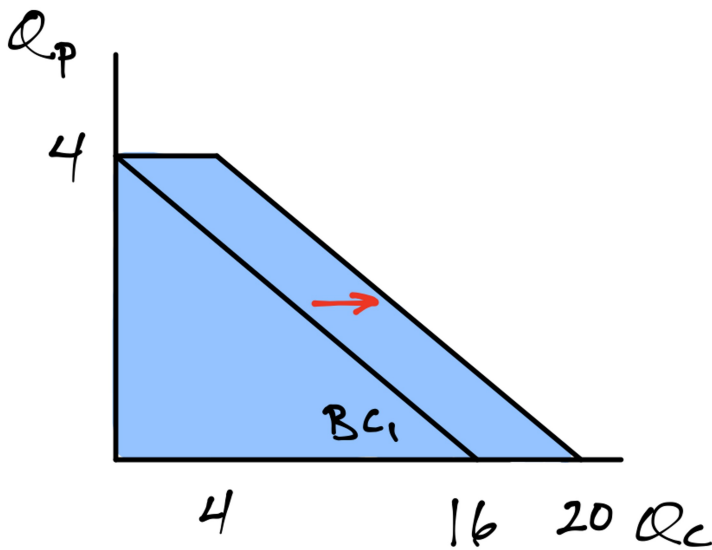
Intercepts and slope:

$$Q_p = \frac{48}{12} = 4$$

$$Q_c = \frac{48}{4} = 12$$

$$m = -\frac{4}{12} = -\frac{1}{3}$$

Revised BC with 4 free coffees:



$$Q_p = \frac{48}{12} = 4$$

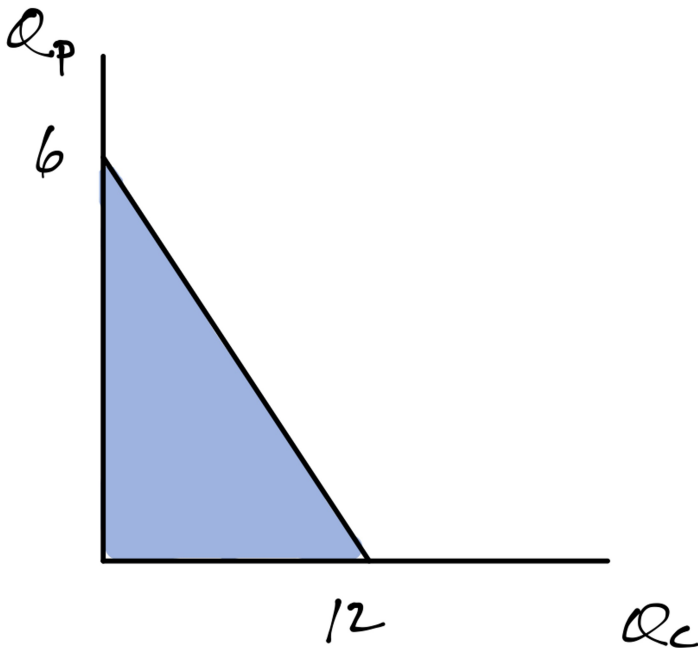
$$Q_c = \frac{48}{3} + 4 = 20$$

Adding a time constraint

$$T \quad 6 \text{ hr}$$

$$P_c^T \quad 0.5 \text{ hr}$$

$$P_p^T \quad 1 \text{ hr}$$



Intercepts and slope:

$$Q_p = \frac{T}{P_p^T} = \frac{6}{1} = 6$$

$$Q_c = \frac{T}{P_c^T} = \frac{6}{0.5} = 12$$

$$m = -\frac{P_c^T}{P_p^T} = -\frac{0.5}{1} = -0.5$$

Combined diagram:

