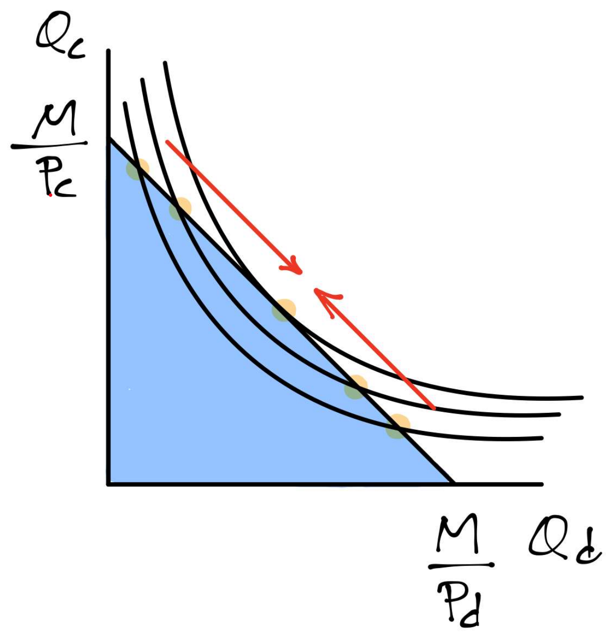
Corner solutions

Characteristics of the equilibrium from last time:

1. On the BC line (spending all of M)
2. Slope of IC matches slope of BC (tangent)



This type of equilibrium is known as an ***interior solution***

Important exception to the slope rule: ***corner cases***

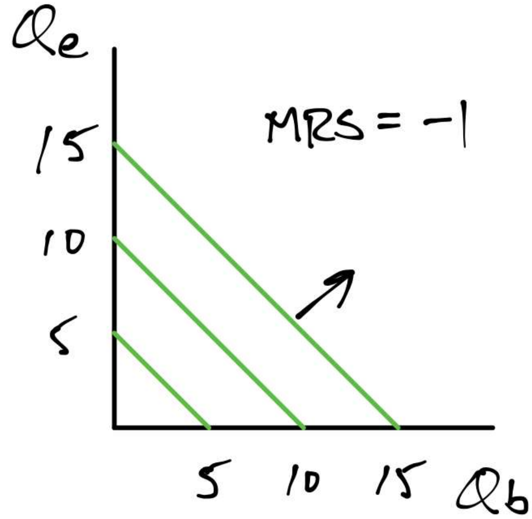
Slope rule doesn't apply if best bundle is at a **BC or IC corner**

Case 1: perfect substitutes

Example: gas from BP or Exxon

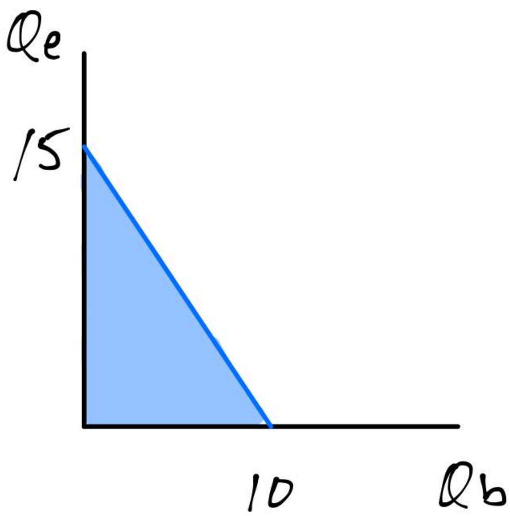
Preferences:

Buyer considers goods identical, $MRS = -1$



Budget constraint:

$$M = \$30, P_b = \$3, P_e = \$2$$

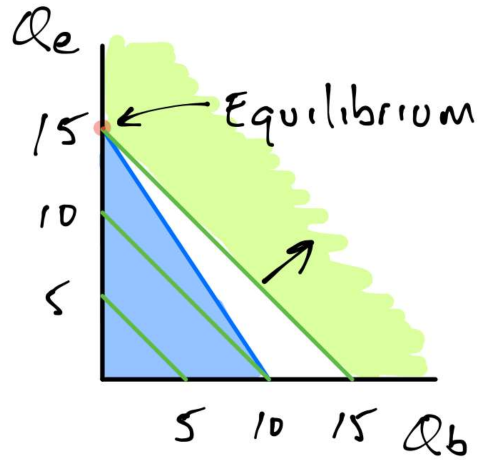


Intercepts:

$$Q_e = \frac{\$30}{\$2} = 15$$

$$Q_b = \frac{\$30}{\$3} = 10$$

Equilibrium:



Feasible bundle on highest IC:

At corner of BC

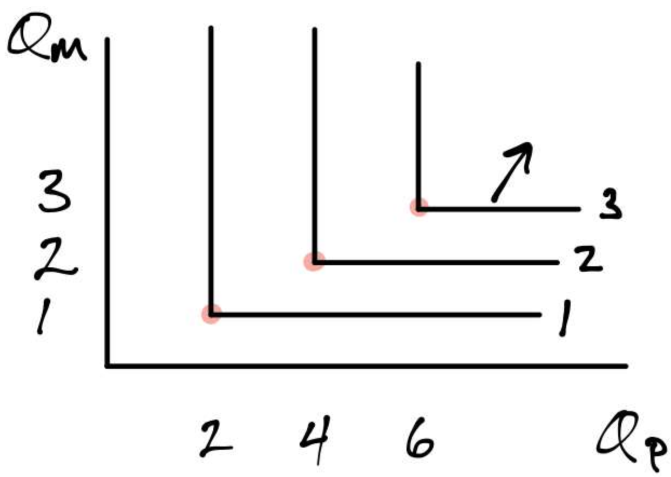
Corner case: slopes don't match

Case 2: perfect complements

Example: movies and popcorn

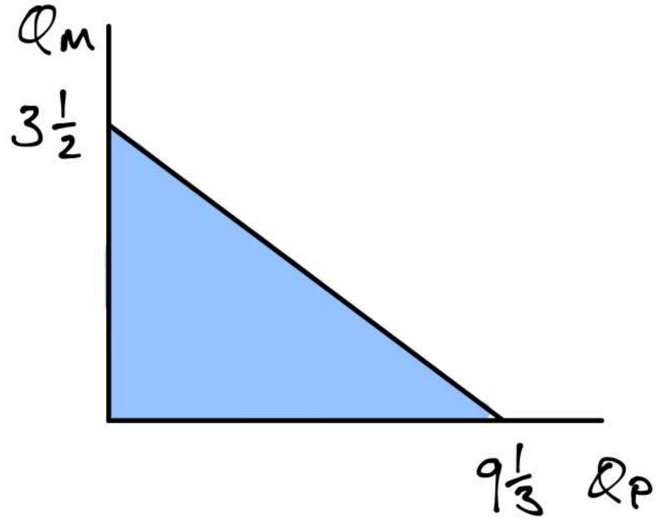
Preferences:

Wants exactly 2 popcorn (p) with each movie (m)



Budget constraint:

$M = \$28, P_p = \$3, P_m = \$8$

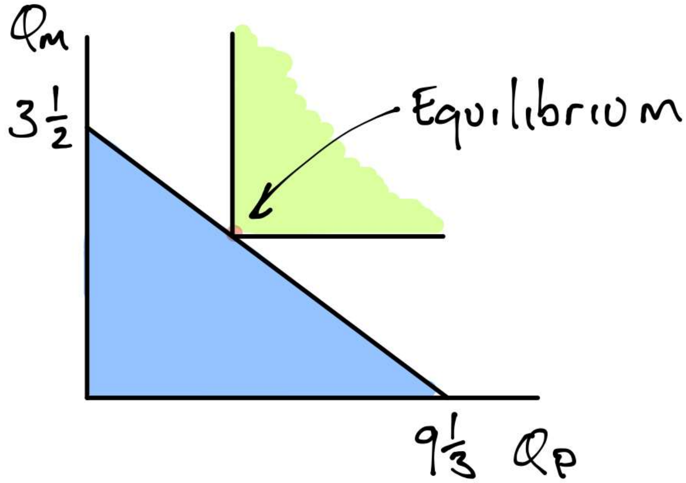


Intercepts:

$$Q_m = \frac{\$28}{\$8} = 3.5$$

$$Q_p = \frac{\$28}{\$3} = 9\frac{1}{3}$$

Equilibrium:



Feasible bundle on highest IC:

At corner of IC

Corner case: slopes don't match

Finding the equilibrium bundle:

Know BC:

$$\$3 * Q_p + \$8 * Q_m = \$28$$

Know person always chooses Q's in fixed ratio:

$$\frac{Q_p}{Q_m} = \frac{2}{1} \qquad \text{or} \qquad \frac{Q_m}{Q_p} = \frac{1}{2}$$

⚠ **Always** start with a ratio: **do not** trust English

Rearranging either ratio gives:

$$Q_p = 2Q_m \qquad \text{or} \qquad 2Q_m = Q_p$$

Substituting preference equation into the BC:

$$\$3 * (2Q_m) + \$8 * Q_m = \$28$$

$$\$6 * Q_m + \$8 * Q_m = \$28$$

$$\$14 * Q_m = \$28$$

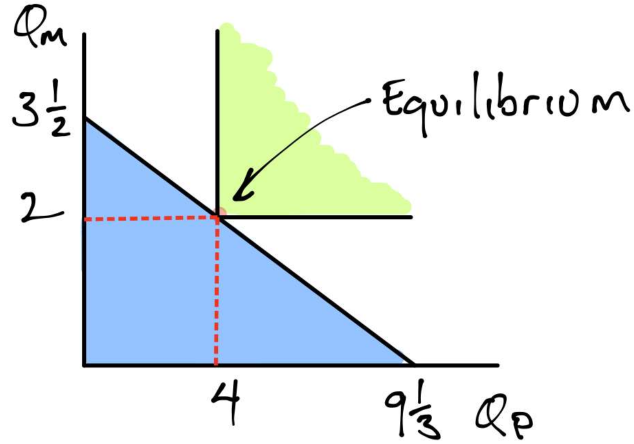
$$Q_m = 2$$

$$Q_p = 2(2) = 4$$

Check:

$3*4 + $8*2 = $28 ✔

Finishing the graph:



Daily exercise