

$$MRTS = \frac{\Delta K}{\Delta L} = \frac{\frac{\Delta Q}{MP_K}}{\frac{\Delta Q}{MP_L}} \Rightarrow \frac{\Delta Q}{MP_K} * \frac{MP_L}{\Delta Q} = \frac{MP_L}{MP_K}$$

Isocost Lines

A firm will seek to produce a given output level using a combination of inputs that will minimize the cost of production given the prices of the inputs. Assuming a perfectly competitive input market so that the inputs are available at a constant price the total cost of any given input combination is given by:

$$C = C_L L + C_K K$$

The slope of the isocost line is given by P_L/P_K

Amount of capital employed:

$$K \Rightarrow \frac{C}{C_K} - \frac{C_L}{C_K} L$$

Amount of labour employed:

$$L = \frac{C}{C_L} - \frac{C_K}{C_L} K$$

Exercise

Given that the firm wishes to restrict total cost to Kshs 800, and the cost function is $C = 0.4L + 0.6K$ how many units of labour will it employ if it employs 10 units of capital; 20 units of capital?

Least-Cost Input Combination

The optimal input combination can be found by combining the isoquant and isocost curves. This occurs at the point of tangency between the two curves so that the slopes are the same, ie:

$$\frac{MP_L}{MP_K} = \frac{P_L}{P_K} \Rightarrow \frac{MP_L}{P_L} = \frac{MP_K}{P_K}$$