7.8 Calculus of Choice

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Lagrangian

$$L = U(x,y) + \lambda(m - P_x X - P_y Y)$$

$$\frac{dL}{dx} = \frac{dU}{dx} - \lambda P_x = 0$$

$$\frac{dL}{d\lambda} = m - P_x X - P_y Y = 0 \rightarrow m = P_x X + P_y Y$$

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} \quad \text{and} \quad \frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

$$MRS_{xy} = \frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

$MU_x = 2$ and $MU_y = 1 \rightarrow 2y = 1x$