

Utility Sample Question (worth 10 points)

A consumer has preferences over a good A and a good B , the quantities of each being written x_A and x_B .

Assume that the consumer's tastes can be represented by regular downward-sloping indifference curves, convex to the origin (i.e. they get flatter as one moves in a horizontal direction). And, as is standard, let utility increase as the consumer has more of both goods.

a) Consider a point W on an indifference curve, drawn with x_A on the horizontal axis and x_B on the vertical axis. At that point, the consumer has a marginal utility of good $A = 4$ and the marginal utility of good $B = 2$. What will the slope of the consumer's indifference curve be through that point? Please show your calculations. (4 points)

The slope of the consumer's indifference curve is given by $dx_B/dx_A = -\frac{\partial U/\partial x_A}{\partial U/\partial x_B}$. In words, we can write this as $dx_B/dx_A = -(\text{marginal utility of good } A / \text{marginal utility of good } B) \equiv MRS_{A,B}$.

In this case, the slope of the indifference curve at point $W = -4/2 = -2$, substituting into this formula.

b) What is the intuition for your result in part a)? [Two sentences.] (3 points)

Intuitively, at W , the consumer values an incremental unit of good A twice as much as an incremental unit of good B . Thus, if the consumer were to reduce the *quantity* of good A fractionally, then the consumer would need to increase the quantity of good B by exactly twice that much in order to stay at the same utility level.

c) Suppose the consumer faces a relative price of -2 (so $P_A/P_B = -2$). If the consumer is at a point on the budget line for which the slope of the indifference curve is -3, is the consumer maximizing utility? If not, what adjustments should the consumer make? Please be specific. (3 points)

At the initial point, the slope of the budget line is less steep than the slope of the indifference curve, so that the relative price ratio is less steep than the consumer's marginal rate of substitution of good A for good B . In this case, the consumer should increase the consumption of good A and reduce the consumption of good B by moving down the budget line (all points on which are affordable), given the assumption about the regular shape of the indifference curves. That way, the consumer is able to attain higher indifference curves and so increase utility relative to the initial point.