

Economics Tripos Part I Paper 1  
Microeconomics  
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### Supervision 1: Preferences and Utility

#### *Short questions*

1. (a) What axioms do we need to impose on consumer choice to be able to represent preferences with a utility function? What would happen if one of them were not satisfied?  
  
(b) What is marginal utility? What is meant by diminishing marginal utility?  
  
(c) What is an indifference curve?  
  
(d) What is meant by convex preferences? Are preferences always convex if the utility function is concave?

#### *Problem*

2. Consider two goods  $x$  and  $y$ . The price of good  $x$  is  $p_x$  and the price of good  $y$  is  $p_y$ . A consumer's income is denoted  $m$ .  
There are three consumers who have the following preferences:

- (a)  $u(x, y) = \sqrt{xy}$
- (b)  $u(x, y) = \min(2x, y)$
- (c)  $u(x, y) = 2x + y$

Present the consumer's utility maximisation problem graphically for these three consumers and comment on the marginal rate of substitution for each case.

Next consider a change in the price of good  $x$ . Comment on the price and income effect in each case. What factors dominate whether the price or the income effect dominates?

Verify your intuition by maximising the utility function subject to the budget constraint and solve for the quantities demanded by each consumer.

Is there always an interior solution?