

practice questions for section 7.5

Assume a person named Walter, whose preferences satisfy the rationality conditions. Also assume the following set of prizes: $\{a, b, c, d, e\}$.

prediction:

1. What is a question you would be entitled to ask Walter by virtue of the assumption that his preferences satisfy the completeness and transitivity conditions?
2. What would be your purpose in asking him questions like that?
3. What is a question you would be entitled to ask Walter by virtue of the assumption that his preferences satisfy the continuity condition?
4. What would be your purpose in asking him questions like that?

answer choices for questions 1 and 3:

- (a) "Which prize is your favorite?"
- (b) "What is your preference ordering over the prizes?"
- (c) "What is one of the prizes that is neither your favorite nor your least favorite?"
- (d) "How strongly do you prefer your favorite prize to your least-favorite prize?"
- (e) "If you were to receive a prize at random, what is the probability that it would be prize a ?"
- (f) "Do you prefer a to b , or do you prefer b to a , or are you indifferent between a and b ?"
- (g) "What is the probably p such that you are indifferent between prize b and a lottery giving you a probability- p chance at prize a and a probability- $(1 - p)$ chance at prize e ?"
- (h) "If you were to receive a lottery giving you a probability- p chance at prize a and a probability- $(1 - p)$ chance at prize e , what would be the probability of that lottery resulting in prize a ?"

answer choices for questions 2 and 4:

- (i) to identify his favorite and least-favorite prizes
- (j) to identify which of his preferences form a cycle
- (k) to determine his preference ordering over the prizes
- (l) to ascertain his beliefs about the probabilities of receiving the various prizes
- (m) to come up with an interval utility function that represents his preferences over the prizes
- (n) to identify, for each prize, an equally desirable lottery involving his favorite and least-favorite prizes
- (o) to identify the prize that, in his opinion, marks the sharpest discontinuity between the prizes he likes and the prizes he dislikes

5. Suppose Walter's favorite prize is a and his least-favorite prize is e , and suppose the values of p for prizes b , c , and d , respectively, are $2/3$, $1/2$, and $1/4$. If you had to predict Walter's preference between two options, and one of them was the lottery $L(1/5, d, b)$, what lottery would you convert that into? (If it is a compound lottery, do not reduce it until the next question.)
6. Would that lottery need reducing? If so, what would it reduce to?
7. If the other option was the prize c , what lottery would you convert that into? (If it is a compound lottery, do not reduce it until the next question.)
8. Would that lottery need reducing? If so, what would it reduce to?
9. Consider the lotteries you derived in answer to questions 6 and 8. What does the better-odds condition imply about Walter's preferences over those two lotteries?

reconciliation:

10. What interval utility function would you impute to Walter, to represent his preferences over the five prizes?
11. What would be the expected utility of the first lottery mentioned in question 5 – namely, $L(1/5, d, b)$?
12. What would be the expected utility of the prize mentioned in question 7 – namely, prize c ?
13. Which option would have the higher expected utility – $L(1/5, d, b)$ or prize c ?
14. What does your answer to question 13 have in common with your answer to question 9?