Midterm 1

You have until 3pm to complete the exam, be certain to use your time wisely. For multiple choice questions, mark your answer on your scantron sheet. Choose only one answer for each multiple choice question; if more than one letter is filled in for a question it will be marked wrong. For the short answer questions, write your answers directly on the exam. Show your work clearly, place a box around final answers and be certain to label any graphs you draw. Final answers may be left as fractions. Non-graphing calculators may be used but they should not be necessary. Good luck!

Name: **ID Number:**   **Section:**

SECTION I: MULTIPLE CHOICE (60 points)

1. Suppose that we are told that Alice strictly prefers A to B and B to C. We can then say that Alice prefers A to C if which of the following holds for her preferences?

   (a) Completeness.
   (b) Monotonicity.
   (c) Transitivity.
   (d) Convexity.

2. Bobby consumes only CDs and DVDs and is currently spending all of his income and buying positive amounts of both goods. At his current consumption bundle, his indifference curve is flatter than his budget line (assume CDs are on the horizontal axis, DVDs are on the vertical axis and that Bobby has standard, convex indifference curves). Bobby can increase his utility by:

   (a) Buying more CDs and fewer DVDs.
   (b) Buying more DVDs and fewer CDs.
   (c) Buying fewer CDs and fewer DVDs.
   (d) Bobby is already maximizing his utility.

3. Adam's indifference curves for apples and bananas are upward sloping (you can assume apples are on the horizontal axis and bananas are on the vertical axis). We can say for certain that:

   (a) Both apples and bananas are good.
   (b) Both apples and bananas are bad.
   (c) One of the fruits is a good while the other is a bad.
   (d) None of the above.

4. If movie tickets are a 'good' (as opposed to a 'bad'), which of the following statements must be false?

   (a) Utility graphed as a function of movie tickets has a positive slope.
   (b) Marginal utility graphed as a function of movie tickets has a positive slope.
   (c) Utility graphed as a function of movie tickets has a negative slope.
   (d) Marginal utility graphed as a function of movie tickets has a negative slope.

5. Assume that peanut butter and jelly are complements (but not perfect complements) and both are normal, ordinary goods. Suppose we have a graph with peanut butter on the horizontal axis and jelly on the vertical axis. The price offer curve we obtain by varying the price of peanut butter will:

   (a) Have a positive slope.
   (b) Have a negative slope.
   (c) Be a vertical line.
   (d) Be a horizontal line.

6. Which of the following utility functions would represent the same preferences?

$$U_A(x, y) = x + y \qquad U_B(x, y) = 2x + 2y \qquad U_C(x, y) = -2x + -2y$$

   (a) U_A and U_B.
   (b) U_A and U_C.
   (c) U_B and U_C.
   (d) U_A, U_B and U_C.

7. Jack's marginal utility from bikes (MU_B) and his marginal utility from cars (MU_C) are both constant. If $MU_B = 4$ and $MU_C = -2$, then Jack will (you can assume prices are positive):

   (a) Buy only bikes.
   (b) Buy only cars.
   (c) Buy either bikes or cars depending on the ratio of the prices.
   (d) Be indifferent between all points on budget line when the $\frac{p_B}{p_C} = 2$.

8. Which of the following will definitely not change a person's budget constraint?

   (a) A doubling of all prices.
   (b) A doubling of all prices and income.
   (c) Increasing all prices and income by one dollar.
   (d) (b) and (c).

9. Suppose that coffee is an inferior good and espresso is a normal good. On a graph with coffee on the horizontal axis and espresso on the vertical axis, the income offer curve will:

   (a) Have a positive slope.
   (b) Have a negative slope.
   (c) Be a horizontal line.
   (d) Be a vertical line.

10. Dimishing marginal rate of substitution for goods x and y implies:

   (a) Increasing marginal utility for good x.
   (b) Increasing marginal utility for good y.
   (c) Indifference curves that get flatter as you move from left to right.
   (d) All of the above.

11. Which of the following utility functions exhibit a constant rate of marginal substitution?

$$U_A(x, y) = x + y \qquad U_B(x, y) = x^2 + y^2 \qquad U_C(x, y) = x^2 + 2xy + y^2$$

   (a) U_A.
   (b) U_A and U_B.
   (c) U_A and U_C.
   (d) U_B and U_C.

12. Suppose that your demand for cookies (C) in terms of income (I), the price of cookies (p_C) and the price of milk (p_M) is given by:

$$C(I, p_C, p_M) = \frac{40I}{p_C^{\frac{1}{2}} + p_M^{\frac{1}{2}}}$$

   Which of the following statements is true?

   (a) Cookies are a normal, ordinary good.
   (b) Cookies are an inferior, ordinary good.
   (c) Cookies are a normal, Giffen good.
   (d) Cookies are an inferior, Giffen good.

13. Suppose that meatloaf is a Giffen good and a person only consumes meatloaf and steaks. Both the marginal utility of steaks and the marginal utility of meatloaf are positive. An increase in the price of meatloaf will cause:

   (a) A decrease in the number of steaks purchased.
   (b) An increase in the number of steaks purchased.
   (c) No change in the number of steaks purchased.
   (d) There is not enough information to tell what will happen to the number of steaks.

14. Suppose that the marginal utility of x is always positive and the marginal utility of y is always positive. If a particular consumption bundle (x^*, y^*) maximizes utility, which of the following must be true?

   (a) The budget line is tangent to the indifference curve passing through (x^*, y^*).
   (b) (x^*, y^*) lies on the budget line.
   (c) (a) and (b).
   (d) Neither (a) nor (b) must be true.

15. Assume pens and pencils are normal, ordinary goods. On a graph with pencils on the horizontal axis and pens on the vertical axis, the steeper the indifference curves are:

   (a) The more pens a person is willing to trade for an additional pencil.
   (b) The more pencils a person is willing to trade for an additional pen.
   (c) The greater the price of pencils is relative to the price of pens.
   (d) The greater the price of pens is relative to the price of pencils.

SECTION II: SHORT ANSWER (40 points)

For this section, be certain to show your work and clearly label any graphs you draw. Give complete answers but keep them concise. Please place a box around final answers where appropriate.

1. For each part below, use the information given in the graphs to draw a set of three indifference curves on the provided blank graph. Note that the blank graph has X on the horizontal axis and Y on the vertical axis. Be certain to label the direction in which utility is increasing. (6 points each)

(a)

(b)
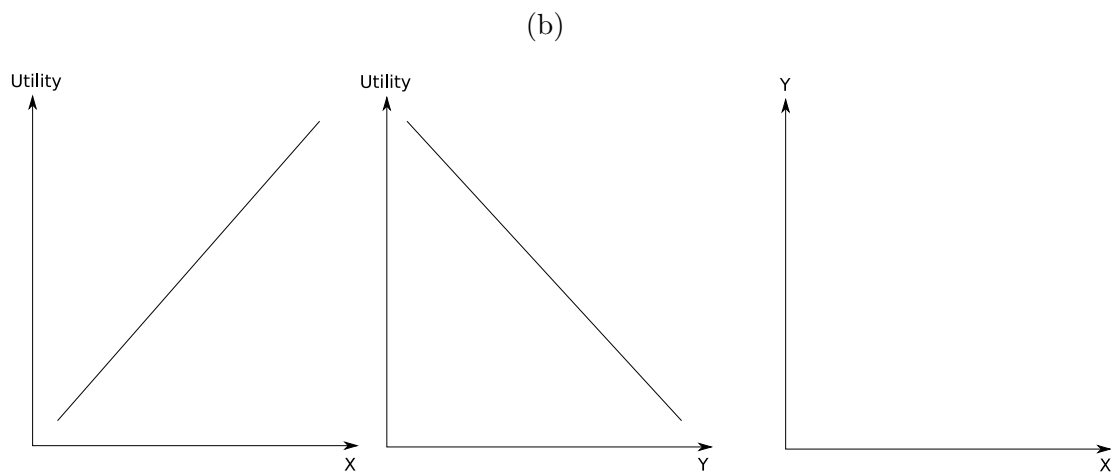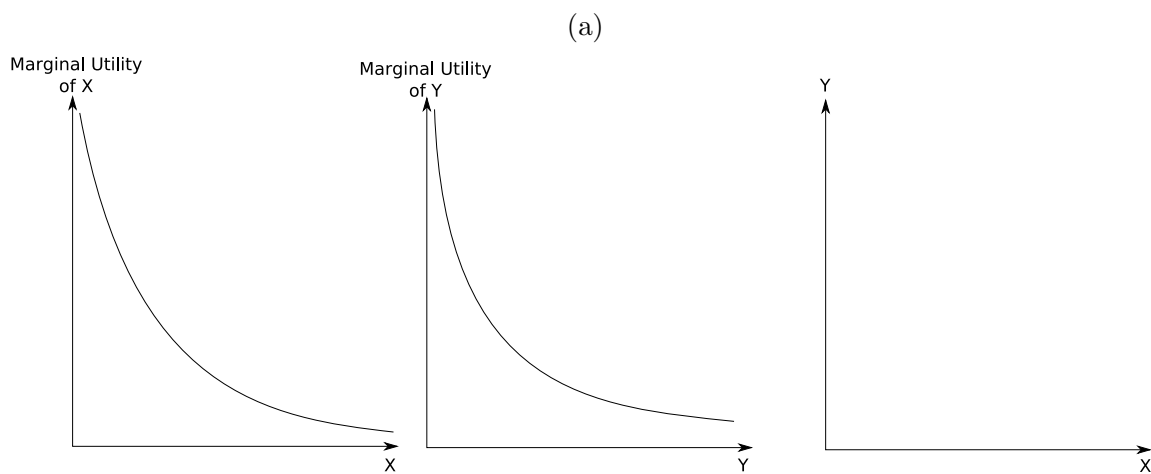
2. Bobby consumes only sandwiches (S) and newspapers (N). His utility function in terms of sandwiches and newspapers is given by:

$$U(S, N) = 10S^{\frac{1}{2}}N^{\frac{1}{2}}$$

(a) Derive expressions for the marginal utility of sandwiches (MU_S) and the marginal utility of newspapers (MU_N). Your expressions should be functions of S and N. You must show your work to get credit (just writing the final expressions will not get credit). (6 points)

(b) Using your expressions from part (a), derive an expression for the marginal rate of subsitution in terms of S and N. Explain whether this utility function exhibits an increasing or diminishing marginal rate of substitution. (8 points)

(c) Find Bobby's optimal number of sandwiches and newspapers if his income is \$60, the price of a sandwich is \$5, and the price of a newspaper is \$1. You must show your work to get credit. (14 points)