DO NOT TURN FROM THIS PAGE UNTIL INSTRUCTED TO DO SO!

First name:

Last name:

Exam policies and details:

1. Do not remove staple or separate this booklet.

2. All answers must be written in this booklet.

3. No calculators or communication devices permitted.

4. Cellphones should be switched off and all possessions other than pens must be left at the back of the classroom during the exam.

5. All answers should be written in pen.

6. No speaking during the exam except to the lecturer and proctors.

7. Students more than 15 minutes late may not be let into the examination room.

8. There are 7 questions in this exam, many of which have multiple parts.

9. When asked to explain your answer, you must do so to get full credit.

10. Raise your hand if you need to leave the room for any reason. You may not take the exam or any belongings out of the room.

11. Students taking the exam at 12:30pm will not be permitted to hand their exams in until time is called at 2:15pm.

12. Points will be deducted from students who continue work after time is called.

Honor pledge: I agree to neither give help to nor receive any help from others. I understand that the use of a calculator or communication device on this exam is academic misconduct. I also understand that providing any information about this exam to other students is academic misconduct, as is taking or receiving any information from other students. Thus, I will cover my answers and not expose my answers to other students. It is important to me to be a person of integrity and that means ALL ANSWERS on this exam are my answers. Any violation of these guidelines or the exam policies will result in a penalty of receiving a zero on this exam. You will additionally be reported. **By signing your name here, you agree to the honor pledge and affirm that you have read it and the exam policies above:**

_____

Score (*for instructor use only*):

Q	S	Q	S	Q	S
1	/15	4	/16	7	/8
2	/12	5	/21		
3	/20	6	/8	**T**	/100

1. (15 points total, 3 points each) For each of the following statements, state whether it is true or false and explain your answer with 1-2 sentences.

    (a) The following statement is normative: "If the University of Wisconsin raises tuition rates, more students will choose to attend the university." *(Note: I am asking whether it's true that the statement is normative, not about the truth of the statement itself.)*

    (b) A model with unrealistic assumptions can yield only unrealistic predictions.

    (c) The marginal rate of substitution, negated, at a point equals the slope of an indifference curve through that point.

    (d) If a good is inferior, its demand curve will shift to the left when w increases.

    (e) If demand for a good is elastic, supply of that good must be inelastic.

2. (12 points total, 3 points each) Suppose there are three alternatives: x, y, and z. For each of the following preference relations, say whether it violates the transitivity assumption, the completeness assumption, both, or neither:
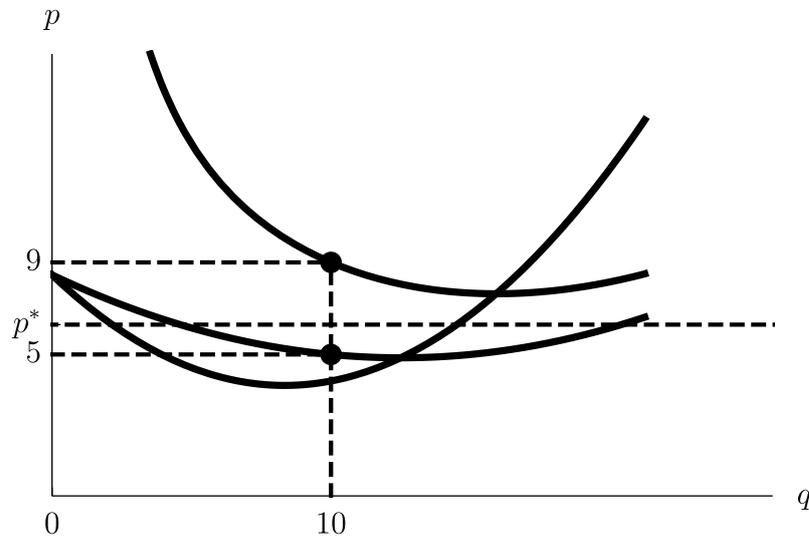
(a) $\{z \sim y, \quad x \preceq y, \quad z \succeq y, \quad x \sim y\}$

(b) $\{x \sim z, \quad x \succ y, \quad y \sim z\}$

(c) $\{x \succeq z, \quad z \preceq y, \quad x \prec y, \quad z \prec x\}$

(d) $\{y \prec z, \quad z \succ x, \quad z \succeq y\}$

3. (20 points total) For these exercises, assume perfect competition and consider the following graph:

(a) (6 points) Label the three curves on the plot above correctly. *Note: Make sure to think about it first so that you don't need to change your labels, which could make your work hard to read.*

(b) (6 points) Draw arrows (with labels at the other end) to the optimal production point, the break-even point, and the shutdown point. *Note: Again, please do this neatly so we can give you as much credit as possible.*

(c) (2 points) Is the firm making profits, losses, or breaking even? Explain your answer in one sentence.

(d) (2 points) Would you expect other firms to enter, this firm to exit in the short-run, or this firm to exit in the long-run, or none of these? Explain your answer in 1-2 sentences.

(e) (4 points) What are the firm's total fixed costs? (a specific number)

4. (16 points total) Suppose you like coffee with sugar, but you only enjoy it if there are exactly two teaspoons of sugar per cup of coffee (any other ratio gives you no utility whatsoever). Further, suppose the price per cup of coffee is $p_c = 4$ and the price per teaspoon of sugar is $p_s = 1$. You have $w = 24$ dollars.

   (a) (2 points) Write a correct utility function representation $(u(c, s))$ of these preferences.

   (b) (2 points) What is the name for this type of utility function?

   (c) (6 points) Find optimal consumption, (c^*, s^*).

   (d) (6 points) Find the formula for the inverse demand curve for coffee.

5. (21 points) Suppose market inverse demand is $p = 9 - q$ and market inverse supply curve is $p = q/2$. Remember that the area of a rectangle is the base multiplied by height and the area of a triangle is the base multiplied by height divided by two.

   (a) (2 points) What is the market-clearing price, p^*?

   (b) (3 points) Plot inverse supply and inverse demand and label producer surplus and consumer surplus.

   (c) (4 points) Calculate consumer and producer surplus.

   (d) (2 points) If the government mandates a price $p' = 2$, is this a price ceiling or a price floor?

   (e) (2 points) With $p' = 2$, is there oversupply or overdemand (i.e. shortages)?

   (f) (4 points) Draw another plot and label producer surplus, consumer surplus, and deadweight loss with $p' = 2$.

   (g) (4 points) Calculate consumer surplus, producer surplus, and deadweight loss.

6. (8 points total) Suppose $q = F(K, L) = \sqrt{K} \cdot \sqrt{L}$, $p_K = 1$, and $p_L = 4$. Derive the cost curve, $C(q)$.

Note 1: Remember we switched the letter for output from Y to q but they're the same thing.

Note 2: Useful derivatives:

$$\frac{d}{dK}(\sqrt{K} \cdot \sqrt{L}) = \frac{\sqrt{L}}{2\sqrt{K}} \quad \text{and} \quad \frac{d}{dL}(\sqrt{K} \cdot \sqrt{L}) = \frac{\sqrt{K}}{2\sqrt{L}}$$

7. (8 points total) Suppose you get utility from consumption goods and relaxing: $u(c, r) = c \cdot r + 12r$. You earn a wage of $w = 1$ per hour, and the price of consumption goods is $p_c = 1$. How many hours per day (h) should you work?

Hint: Try to get c out of the utility function.

Note: For any number a,

$$\frac{d}{dr}(a \cdot r - r^2) = a - 2r.$$