



- Name: _____
 - Date: _____
 - Section: _____
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ECON 300: Intermediate Price Theory

Quiz #1: Budget Constraints

INSTRUCTIONS:

- Answer all questions in the spaces provided on the question sheet. Circle the correct answer for the multiple-choice questions.
- This quiz consists of 6 pages, including this one. There are a total of 3 problems with a total of 15 subquestions.
- Please read all questions carefully before you begin answering.
- This is a closed-book quiz. Please remove all materials from the top of the desk and take any necessary items from your bags before the exam begins.

Problem 1. Basic Budget Constraints (40 Points)

Suppose that a consumer is participating in a market that consists of two goods: hats and pens. The market price of each hat is \$5, and a pen is sold at \$2. The consumer is endowed with an income of \$30. Please answer the following questions:

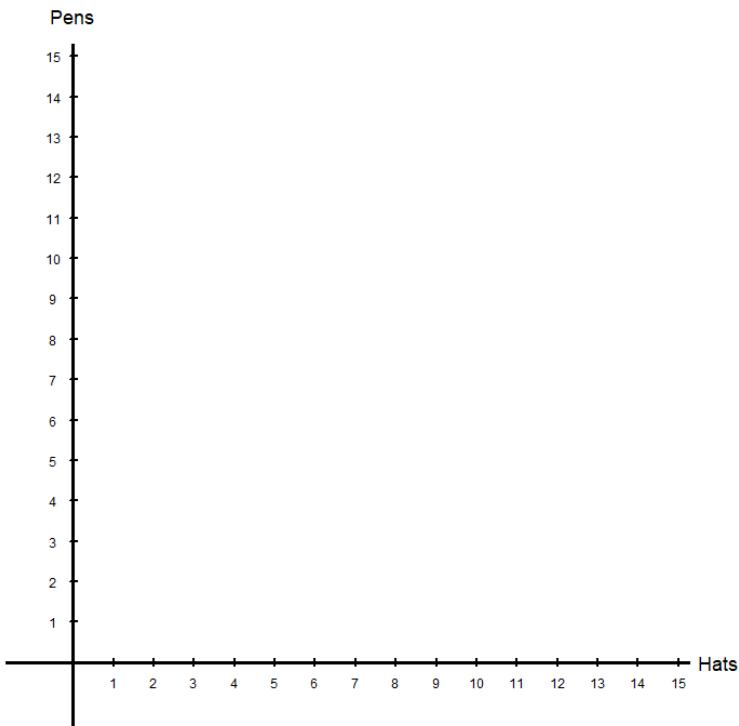
1.A. What is the maximum number of hats that this consumer can purchase? (5 points)

1.B. What is the maximum number of pens that this consumer can purchase? (5 points)

1.C. Provide any three bundles of hats and pens that exhaust the consumer's income. (10 points)

Hint: The first two can be “0 pens and [1.A] hats” and “0 hats and [1.B] pens.”

1.D. Plot the diagram of the consumer's budget constraint in the frame provided below. (15 points)



1.E. Calculate the slope of the budget line. (5 points)

Hint: Use the two intercept points you found in parts [1.A] and [1.B].

Problem 2. Purchase Limits (20 Points)

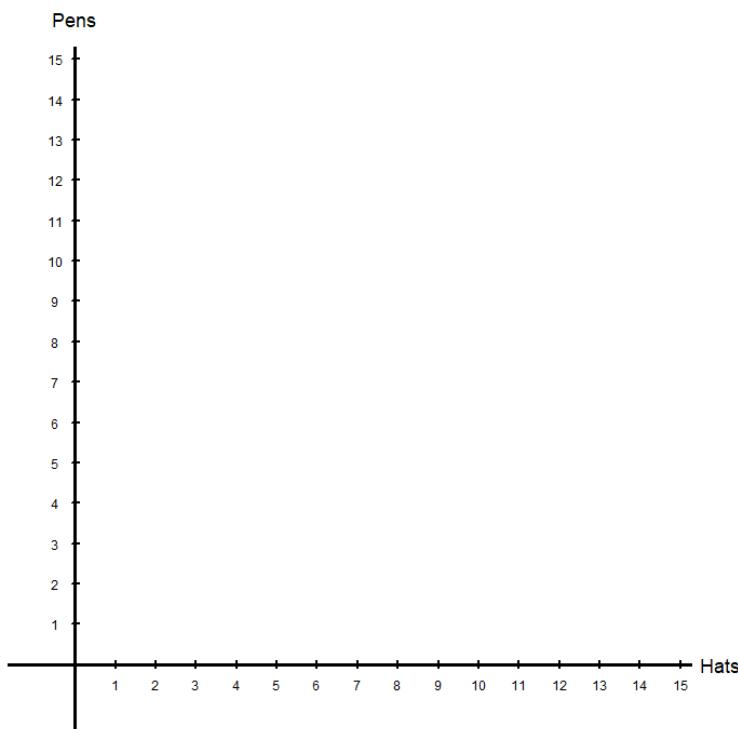
Suppose that the consumer is still participating in the same market for two goods: hats and pens. The market price of each hat is \$5, and each pen is \$2. The consumer has an income of \$30. Due to unusually high demand for pens in the market, the government is imposing a new restriction. **Each individual can purchase at most 10 units of pens.**

2.A. What is the maximum number of hats that this consumer can purchase? (5 points)

2.B. What is the maximum number of pens that this consumer can purchase? (5 points)

2.C. Plot the diagram of the consumer's budget constraint in the frame provided below. (10 points)

Hint: How many hats can a consumer purchase when they already purchased 10 pens?



Problem 3. Interpretation of the Budget Constraint (40 Points)

Suppose that a consumer is endowed an income of M , and is participating in a market with two goods: x and y , where the market prices are P_x and P_y , respectively.

3.A. The collection of all commodity bundles that cost exactly M is called... (5 points)

- (a) Commodity Space
- (b) Budget Set
- (c) Budget Line
- (d) Budget

3.B. The budget constraint for this consumer can be expressed as... (5 points)

- (a) $P_x \cdot x + P_y \cdot y \leq M$
- (b) $P_x \cdot y + P_y \cdot x \leq M$
- (c) $P_x \cdot x + P_y \cdot y > M$
- (d) $P_x \cdot y + P_y \cdot x > M$

3.C. When income M increases, the budget line will... (5 points)

- (a) Pivot around the x intercept.
- (b) Pivot around the y intercept.
- (c) Shift upward.
- (d) Shift downward.

3.D. When price P_x decreases, the budget line will... (5 points)

- (a) Pivot around the x intercept.
- (b) Pivot around the y intercept.
- (c) Shift upward.
- (d) Shift downward.

3.E. What is the correct expression for the x intercept? (5 points)

- (a) $\frac{M}{P_x}$
- (b) $\frac{M}{P_y}$
- (c) $-\frac{P_x}{P_y}$
- (d) $-\frac{P_y}{P_x}$

3.F. What is the correct expression for the slope of the budget line? (5 points)

- (a) $\frac{M}{P_x}$
- (b) $\frac{M}{P_y}$
- (c) $-\frac{P_x}{P_y}$
- (d) $-\frac{P_y}{P_x}$

3.G. What does the slope of the budget line represent? (10 points)