

**Examination: 5024 Economics I (Intermediate Economics)**

**Summer Term 2006**

**July 27, 2006**

**Examiner: T. Riechmann**

**Instructions:**

- The exam consists of two blocks. Block I contains 15 multiple choice questions yielding 3 points each. Block II contains 5 free-form questions yielding a maximum of 11 points each.
- You have 120 minutes to answer all questions.
- Use only the answer sheet to answer the questions.
- Use of non-programmable calculators is allowed.
- Please put your name on *all* sheets.
- Please hand in *all* exam materials.

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**Block I: Multiple Choice**

Please answer all questions of Block I.

For each question, one and only one answer is correct. Mark the box for the answer you think correct on the answer sheet. Marking the correct answer yields 3 points. Marking the wrong answer, no answer, or more than one answer yields no points.

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- In a market with two suppliers, inverse demand is given by  $p = 20 - y_1 - y_2$  ( $p$  giving the price,  $y_1, y_2$  giving the quantities supplied by the respective firms). Both firms have the same cost function  $c(y_i) = 5y_i$ ,  $i \in \{1, 2\}$ . The best quantity to produce for each of the firms equals
  - 5
  - 15
  - 17
  - $15 - \frac{1}{2}y_2$
- For the problem from question 1., if there were three identical firms in the market, the optimum quantity would be
  - higher than for two firms
  - lower than for two firms
  - the same (It is an oligopoly, after all!)
  - indetermined
- Imagine a firm with a cost function  $c(y) = \frac{1}{3}y^3 - 6y^2 + 37y$  with  $y$  giving the firm's output quantity. How large are the firm's fixed costs  $F$ ?
  - $F = 0$
  - $F = 10$
  - $F = y^2 - 12y + 37$
  - $F = 37$
- Given the market price is  $p = 26$ . What quantity  $y^*$  should the firm from question 3. supply?
  - $y^* = 11$
  - $y^* = 1$
  - Either  $y^* = 1$  or  $y^* = 11$ , as they are both the same.

- d) The firm should quit business.
5. Given the market price is  $p = 10$  and the firm from question 3. supplies  $y^* = 9$ . Compute the firm's profit  $\pi$
- $\pi = 180$
  - $\pi = 90$
  - $\pi = -90$
  - $\pi = 0$
6. Given the market price is  $p = 10$  and the firm from question 2. supplies  $y^* = 9$ . Compute the firm's producer's surplus  $P$ .
- $P = 180$
  - $P = 90$
  - $P = 45$
  - $P = 0$
7. Consider the following 'utility function' with  $u(\cdot)$  giving utility and  $x_1, x_2$  giving quantities of goods:  $u(x_1, x_2) = \ln x_1 + \frac{1}{x_2^2}$   
What is the absolute value of the marginal rate of substitution for this function?
- $|MRS| = \frac{1}{2} x_1 x_2$
  - $|MRS| = \frac{1}{2} x_1 x_2^2$
  - $|MRS| = \frac{1}{2} \ln x_1^2 x_2^2$
  - $|MRS| = \frac{1}{2} \frac{x_2^3}{x_1}$
8. Are the preferences underlying the function from problem 7 monotonous?
- Yes, because they do not change.
  - No, because the indifference curves are upward sloping.
  - Yes, because the indifference curves are upward sloping.
  - I don't care and I don't want a point for this answer.
9. For the utility function  $u = x_1 x_2 + x_1 + x_2$  with  $u$  giving utility,  $x_1$  and  $x_2$  quantities of the goods, find the (own-price-) demand function for good 1. Use  $m$  to denote the budget.
- $x_1 = 2 \frac{p_2}{p_1}$
  - $x_1 = 2 \frac{p_2}{p_1} m$
  - $x_1 = \frac{m - p_1 + p_2}{2 p_1}$

- d)  $x_1 = 2 \frac{m-p_1+p_2}{2p_1}$
10. Assuming that the correct answer to question 9. is  $x_1 = 2 \frac{m-p_1+p_2}{2p_1}$ , the two goods are ...
- ... complements
  - ... neutral goods
  - ... substitutes
  - I don't care what they are and I happily waive this point.
11. Assuming that  $x_1 = 2 \frac{p_2}{p_1} m$  is the correct answer to question 9., and prices are  $p_1 = p_2 = 139$ , what is the Engel curve for good 1?
- $x_2 = 2 \frac{p_1}{p_2} m$
  - $x_1 = 2m$
  - $m = \sqrt{x_1^2 + x_2}$
  - $x_1 = 2m + 15x_2$
12. An individual has a utility function  $u = u(p_1, p_2, m)$  with  $p_1, p_2$  giving prices and  $m$  income. First, prices are  $p_1^0$  and  $p_2^0$ . Income is  $m^0$ . Then the price of the first good changes from  $p_1^0$  to  $p_1^1$ . In order to find the equivalent variation, you have to find the income level  $m^1$  that makes
- $u(p_1^1, p_2^0, m^0) = u(p_1^1, p_2^0, m^1)$
  - $u(p_1^1, p_2^0, m^0) = u(p_1^0, p_2^0, m^1)$
  - $u(p_1^0, p_2^0, m^0) = u(p_1^1, p_2^0, m^1)$
  - $u(p_1^0, p_2^1, m^0) = u(p_1^1, p_2^0, m^1)$
13. For the situation from question 12., to find the compensating variation, you must find the income level  $m^1$  that makes
- $u(p_1^1, p_2^0, m^0) = u(p_1^1, p_2^0, m^1)$
  - $u(p_1^1, p_2^0, m^0) = u(p_1^0, p_2^0, m^1)$
  - $u(p_1^0, p_2^0, m^0) = u(p_1^1, p_2^0, m^1)$
  - $u(p_1^0, p_2^1, m^0) = u(p_1^1, p_2^0, m^1)$
14. Consider the function  $f(a, b) = a + b$ . Which one of the following is *not* a strictly positive monotonous transformation of  $f(\cdot)$ ?
- $g(a, b) = 2(a + b)$
  - $g(a, b) = (a + b)^2$

- c)  $g(a, b) = (a + b)^3$
- d)  $g(a, b) = a + b + 17$

15. In a Stackelberg model of duopoly, the equilibrium is such that ...

- a) ... the first player has higher profits.
- b) ... the second player has higher profits.
- c) ... both players have equally high payoffs.
- d) ... payoffs do not matter.

### Block II: Free Form

Please answer all questions of Block II.

1. Use the coordinate system on the answer sheet to draw a marginal cost curve (MC), an average cost curve (AC), and an average variable cost curve (AVC), all belonging to the same cost function. ( $y$  gives the quantity.) Don't forget to denote which curve is which!
2. Use the picture on the answer sheet ( $y$  gives the quantity,  $MC$  marginal costs) and
  - a) add equilibrium quantity and price for a perfectly competitive situation ( $y^c$  and  $p^c$ ),
  - b) add equilibrium quantity and price for a monopolist ( $y^m$  and  $p^m$ ),
  - c) mark the deadweight loss.
3. Use the picture on the answer sheet ( $y$  gives the quantity,  $p$  the price) in order to demonstrate the economic effects of introducing a quantity tax of rate  $t$ :
  - a) Add the new supply function to the picture.
  - b) Denote the original equilibrium price  $p$  and equilibrium quantity  $y$ .
  - c) Add the new price(s) and quantity to the picture.
  - d) Mark the excess burden.
  - e) Describe briefly (in words) what happens to the price(s) in reaction to the introduction of the tax. Use the space on the answer sheet.
4. Explain briefly what 'constant returns to scale' means. Use the space on the answer sheet.
5. What is the income effect? What is the substitution effect? Use the space on the answer sheet.

**Examination: 5024 Economics I (Intermediate Economics)**  
**Answer Sheet**

Name, First Name: \_\_\_\_\_

Immat. No.: \_\_\_\_\_

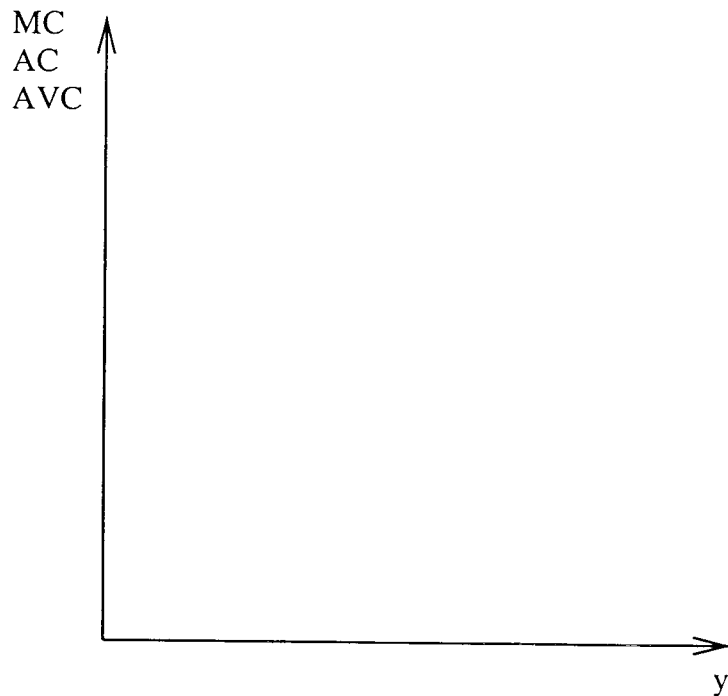
Please mark here, if you participated in the midterm winter 2005/06.

**Block I: Multiple Choice**

Question	a	b	c	d	Question	a	b	c	d
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Block II: Free Form**

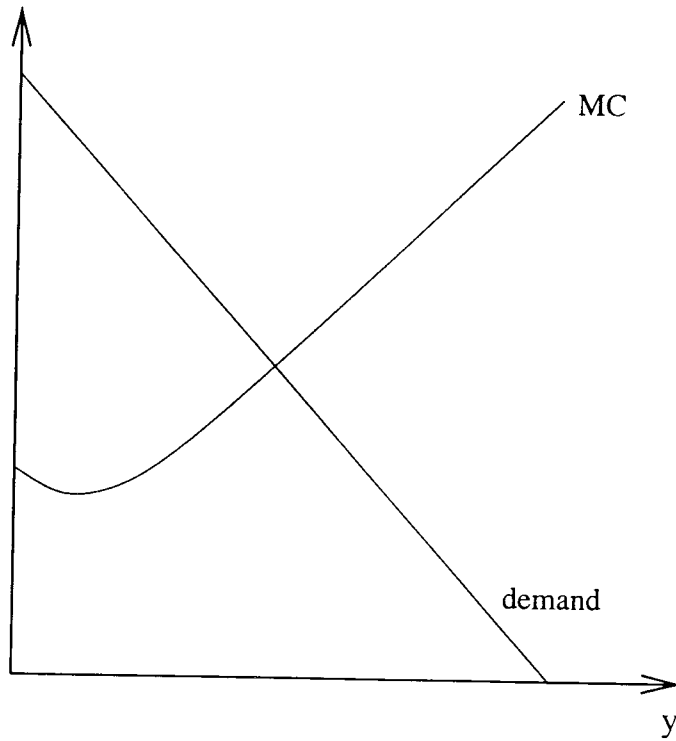
Question 1:



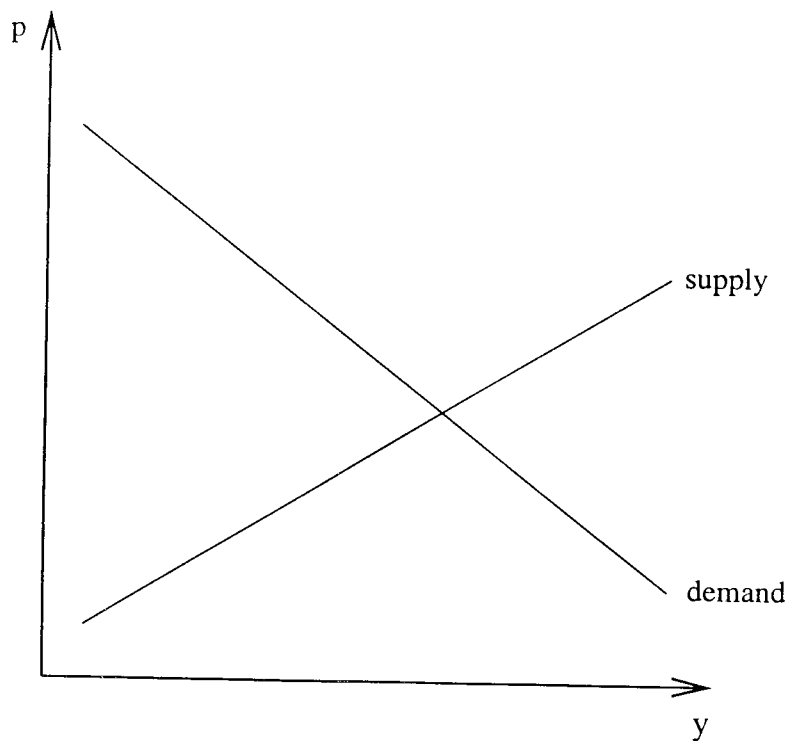
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Question 2:



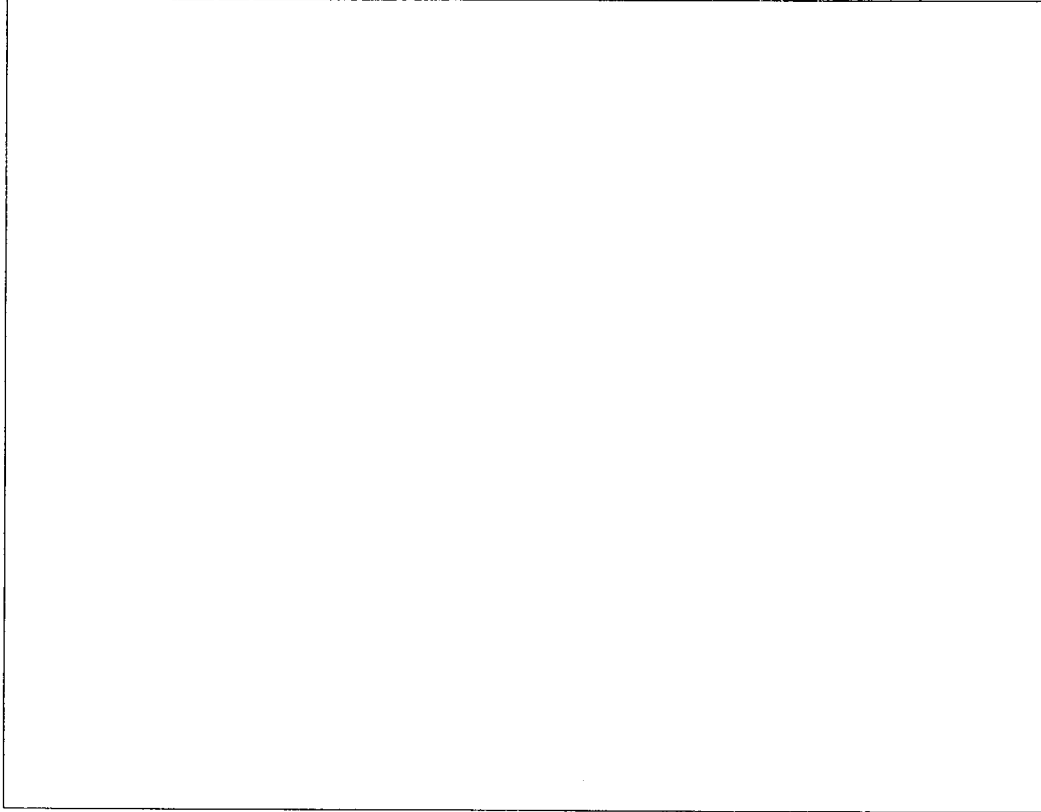
Question 3. a) to 3. d):



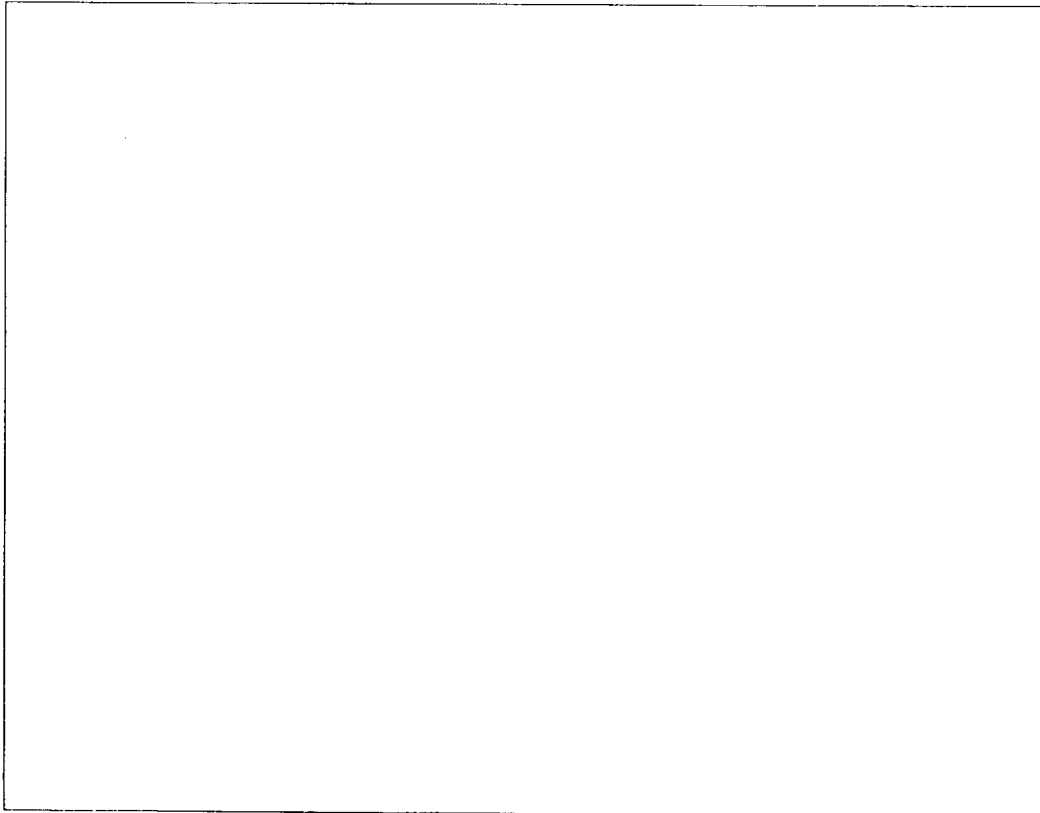
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Question 3. e):

A large, empty rectangular box with a thin black border, intended for the student's answer to Question 3. e). The box is oriented vertically and occupies most of the page's width and a significant portion of its height.

Question 4:

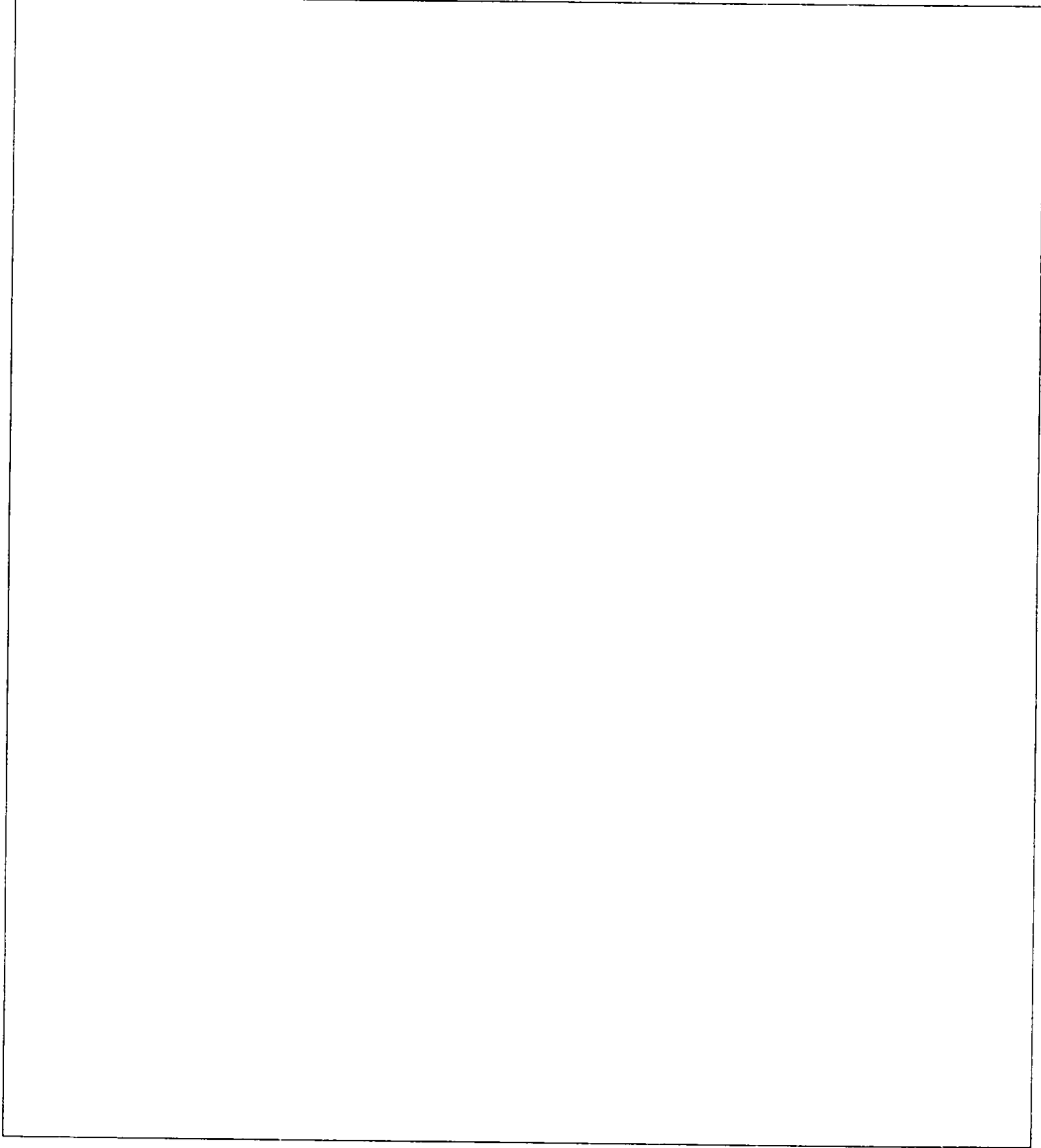
A large, empty rectangular box with a thin black border, intended for the student's answer to Question 4. The box is oriented vertically and occupies most of the page's width and a significant portion of its height.



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Question 5:

A large, empty rectangular box with a thin black border, intended for the student to write their answer to Question 5. The box occupies most of the lower half of the page.