

EXAMINATION #1 ANSWER KEY

Version A

I. Multiple choice

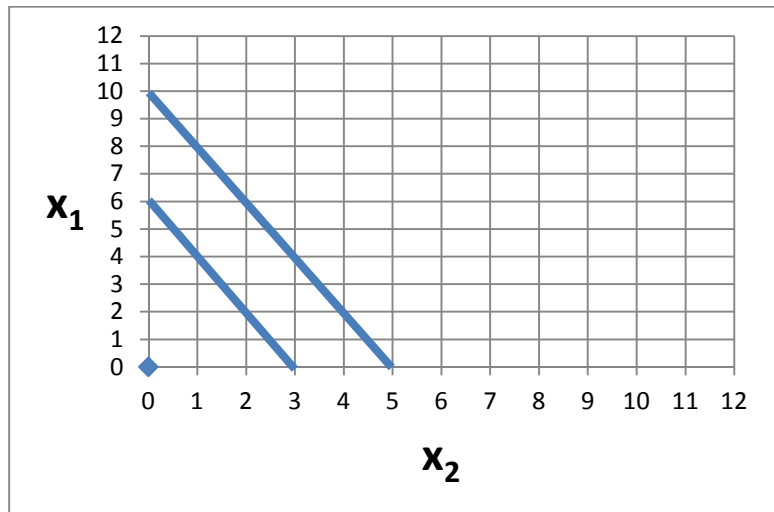
(1)e. (2)b. (3)d. (4)c. (5)d. (6)e. (7)c. (8)a. (9)b. (10)a.

II. Short answer

- | | | | |
|-----|-------------|--------------|---------------|
| (1) | a. decrease | b. 10 units. | |
| (2) | a. increase | b. 3.6%. | |
| (3) | a. down | b. decrease | c. 3/4 units. |
| (4) | a. increase | b. 3 %. | |
| (5) | a. increase | b. 4 %. | |

III. Problems

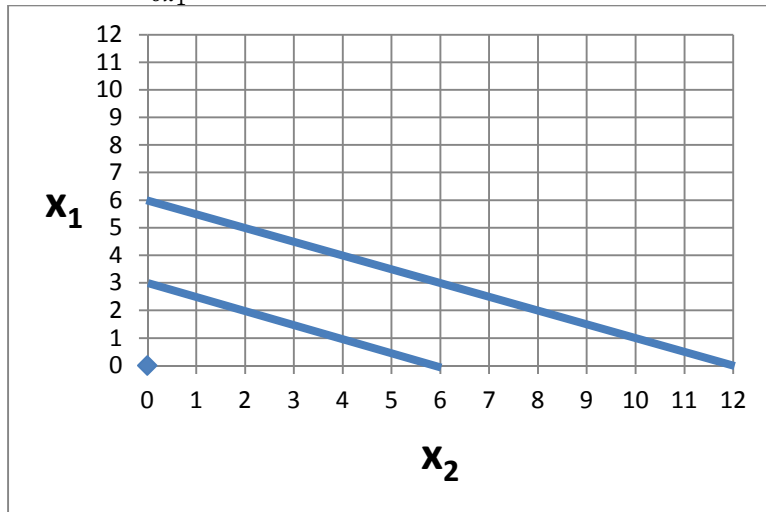
- | | | | |
|-----|--|--|---|
| (1) | a. $dy/dx = 0.2x - 15$. | b. $x^* = 75$. | |
| (2) | a. $\varepsilon_1 = 2$. | b. $\varepsilon_2 = \frac{3x_2}{x_2 - 10}$ | |
| (3) | a. $\frac{\partial y}{\partial x_1} = 5x_1^{-1/2}$. | b. $\frac{\partial y}{\partial x_2} = 4x_2^{-1/2}$. | c. $MRS = \frac{4}{5} \left(\frac{x_1}{x_2}\right)^{1/2}$. |
| (4) | a. $MRS = 2$. | b. | |



- (5) a. $MRS = \frac{3(x_1 - 2)}{2x_2}$. b. any monotonic transformation, such as
 $g(x_1, x_2) = (x_1 - 2)^2 x_2^3 + \text{constant}$, or $g(x_1, x_2) = (x_1 - 2)^2 x_2^3 \times \text{constant}$,
 or $g(x_1, x_2) = [(x_1 - 2)^2 x_2^3]^{\text{constant}}$, or $g(x_1, x_2) = \ln[(x_1 - 2)^2 x_2^3]$.

IV. Critical thinking

(1) Slope of level curves = $-\frac{\frac{\partial y}{\partial x_2}}{\frac{\partial y}{\partial x_1}} = -\frac{1}{2}$. Examples might include the following.



Version B

I. Multiple choice

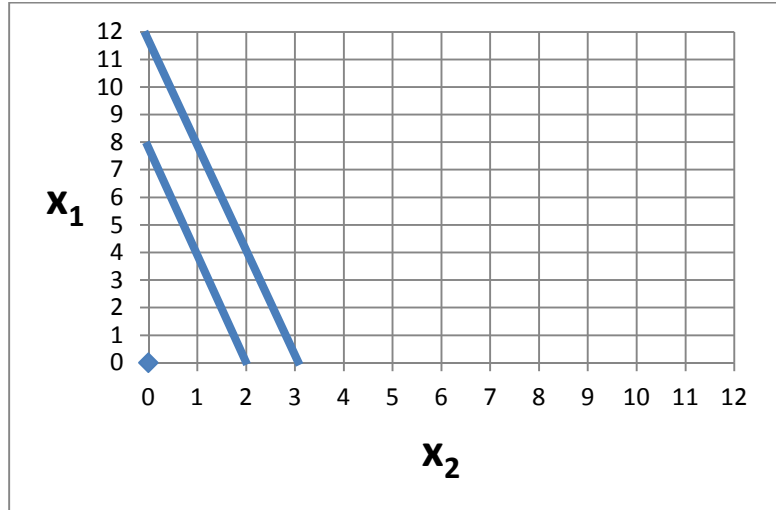
(1)c. (2)d. (3)b. (4)a. (5)a. (6)f. (7)a. (8)e. (9)c. (10)e.

II. Short answer

- | | | | |
|-----|-------------|--------------|---------------|
| (1) | a. decrease | b. 3 %. | |
| (2) | a. decrease | b. 20 units. | |
| (3) | a. down | b. decrease | c. 3/2 units. |
| (4) | a. decrease | b. 2 %. | |
| (5) | a. decrease | b. 3 %. | |

III. Problems

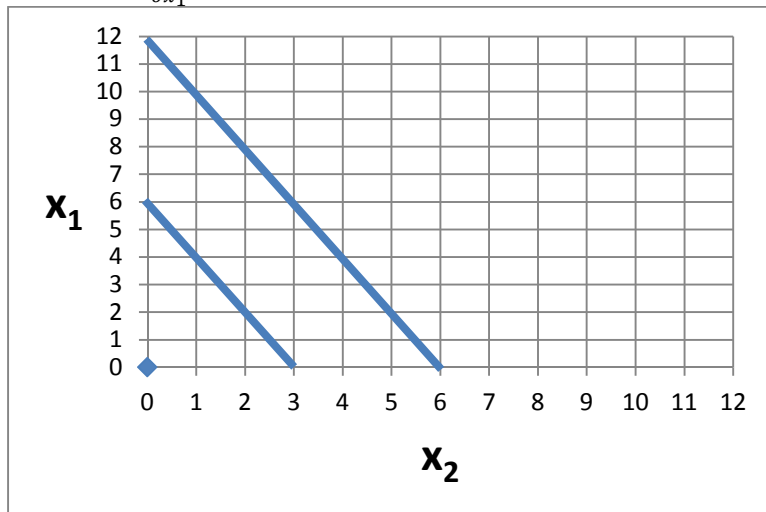
- | | | | |
|-----|--|--|---|
| (1) | a. $dy/dx = 4x - 100$. | b. $x^* = 25$. | |
| (2) | a. $\epsilon_1 = \frac{4x_1}{x_1+3}$. | b. $\epsilon_2 = 3$. | |
| (3) | a. $\frac{\partial y}{\partial x_1} = 2x_1^{-3/2}$. | b. $\frac{\partial y}{\partial x_2} = 3x_2^{-3/2}$. | c. $MRS = \frac{3}{2} \left(\frac{x_1}{x_2}\right)^{3/2}$. |
| (4) | a. $MRS = 4$. | b. | |



- (5) a. $MRS = \frac{3x_1}{4(x_2+3)}$. b. any monotonic transformation, such as
 $g(x_1, x_2) = x_1^4 (x_2+3)^3 + \text{constant}$, or $g(x_1, x_2) = x_1^4 (x_2+3)^3 \times \text{constant}$,
 or $g(x_1, x_2) = [x_1^4 (x_2+3)^3]^{\text{constant}}$, or $g(x_1, x_2) = \ln[x_1^4 (x_2+3)^3]$.

IV. Critical thinking

- (1) Slope of level curves = $-\frac{\frac{\partial y}{\partial x_2}}{\frac{\partial y}{\partial x_1}} = -2$. Examples might include the following.



[end of answer key]