

NAME: _____

1. Graph the system of inequalities. Find the maximum and minimum values of the given function.

$$x + y \geq 3$$

$$5x - 5y \leq 15$$

$$8y \leq 2x + 24$$

$$z = 4x + 6y$$

2. A factory can produce two products, x and y , with a profit approximated by $P = 5x + 23y - 1000$. The production of y can exceed x by no more than 200 units. Moreover, production is limited by the equation $x + 2y \leq 1000$. What production levels yield maximum profit?

[A] $x = 0, y = 0$

[B] $x = 1000, y = 0$

[C] $x = 200, y = 400$

[D] $x = 0, y = 200$

3. What is the maximum value of $z = 50x + 10y$ subject to the constraints $4x + 2y \geq 8$, $6x - 2y \leq 12$, and $-2x + 4y \leq 16$?

[A] 220 [B] 308 [C] 316 [D] 260

4. What is the maximum value of $z = 31x + 10y$ subject to the constraints $3x + 2y \geq 6$, $5x - 2y \leq 10$, and $-2x + 4y \leq 12$?

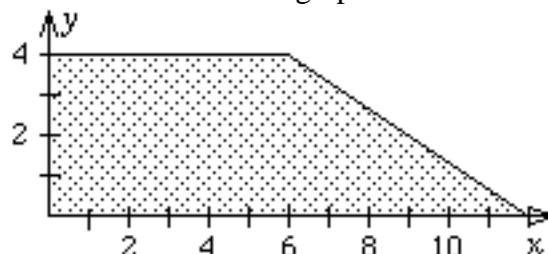
[A] 200 [B] 198 [C] 144 [D] 174

5. Evaluate the equation $M = 4x + 2y$ at $(7, 0)$, $(5, 2)$, $(2, 5)$, $(1, 4)$, and $(0, 7)$. Which point gives the maximum value?

[A] $(0, 7)$ [B] $(1, 4)$ [C] $(2, 5)$

[D] $(5, 2)$ [E] $(7, 0)$

6. Which restrictions are graphed below?



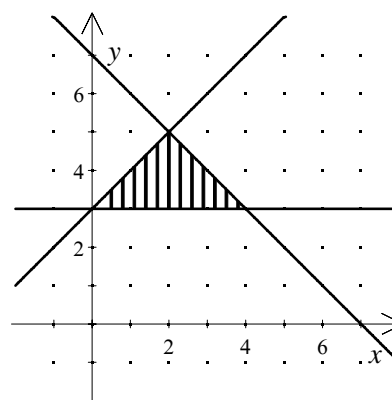
[A] $y \geq 0; 0 \leq x \leq 4; 2x + 3y \leq 24$

[B] $x \geq 0; 0 \leq y \leq 4; 2x + 3y \leq 24$

[C] $x \leq 0; y \leq 0; x + y \leq 4; 3x + 2y \leq 24$

[D] $x \geq 0; 0 \leq y \leq 4; 3x - 2y \leq 24$

7. Which values for x and y minimize the equation $M = 2x + 3y$ for the graph below?



[A] $(0, 3)$ [B] $(0, 7)$ [C] $(2, 5)$

[D] $(7, 0)$ [E] $(4, 3)$

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8. Compare the quantities in Column A and Column B.

Column A

Column B

the maximum value of

the minimum value of

$$C = 2x + 3y$$

$$B = 4x + 5y$$

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The quantities are equal.

[D] The relationship cannot be determined from the information given.

9. Compare the quantity in Column A with the quantity in Column B.

The vertices of a graph of restrictions on x and y are $(0, 0)$, $(0, 40)$, $(20, 40)$, $(60, 20)$, $(60, 0)$. The objective function is $4x + 5y = P$.

Column A

Column B

Maximum of P 325

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The two quantities are equal.

[D] The relationship cannot be determined on the basis of the information supplied.

10. Compare the quantity in Column A with the quantity in Column B.

The vertices of a graph of restrictions on x and y are $(0, 0)$, $(30, 50)$, $(40, 10)$. P is a function that represents the profit from making x number of small bags and y number of large bags.

Column A

Column B

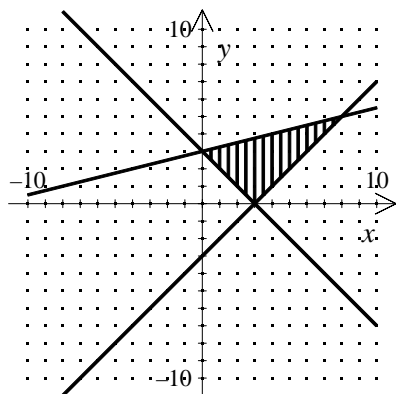
Maximum of P 500

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The two quantities are equal.

[D] The relationship cannot be determined on the basis of the information supplied.



The maximum value of z is 62 at $(8, 5)$ and

[1] the minimum value is 12 at $(3, 0)$.

[2] C

[3] D

[4] D

[5] E

[6] B

[7] A

[8] D

[9] A

[10] D