- 1. A corn refining company produces corn gluten cattle feed at a variable cost of \$20 per ton. If fixed costs are \$3,000 per month and the feed sells for \$50 per ton, how many tons must be sold each month for the company to have a monthly profit of \$6,000?
  - (a) 300 tons
  - (b) 600 tons
  - (c) 100 tons
  - (d) 900 tons
  - (e) 500 tons

- 2. At present, a manufacturer has 1000 units of product in stock. The product is now selling at \$4 per unit. Next month, the unit price will increase by \$0.50. The manufacturer wants the total revenue received from the sale of the 1000 units to be no less than \$4,200. While insuring the total revenue is at least \$4,200, the maximum number of units that can be sold this month is
  - (a) 600
  - (b) 500
  - (c) 300
  - (d) 750
  - (e) 1000

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3. If the solution of the system  $\begin{cases} x + 4y = 3\\ 3x - 2y = -5, \end{cases}$  is (a, b). Then ab =

- (a) -1(b) -3(c) 0(d)  $\frac{1}{3}$
- (e) 3

4. If the slope of the line passing through the points (0, -4) and (3, b) is  $\frac{10}{3}$ . Then b =

- (a) 6
- (b) -4
- (c) -6
- (d) 10
- (e) 14

- 5. The equation of the line that passes through (-4, 10) and parallel to the y-axis is
  - (a) x = -4(b) y = -4(c) x = 10(d) y = 10(e)  $x = -\frac{10}{4}$

- 6. A new television depreciates \$120 per year, and it is worth \$360 after four years. If x is the age of the television in years, then a function that describes the value of this television is
  - (a) y = -120x + 840(b) y = -12x - 140(c) y = -4x + 340(d) y = 120x + 340
  - (e) y = -4x + 840

- 7. The function  $f(x) = -x^2 2x + 6$  has a maximum value that is
  - (a) 7
  - (b) -7
  - (c) 43
  - (d) 8
  - (e) 9

8. If the solutions of the system

$$y = x^2 - 9$$
$$2x + y = 3$$

are (a, b) and (c, d) then a + b + c + d =

- (a) 8
- (b) 6
- (c) 0
- (d) 4
- (e) 2

9. Let (a, b) be a solutions of the system

$$\begin{aligned} x &= y + 1\\ y &= 2\sqrt{x + 2} \end{aligned}$$

then a + b =

- (a) 13
- (b) 10
- (c) 3
- (d) -2
- (e) 0

10. A farm produces three products, A, B, C, that require processing by three machines, I, II, and III. The time in hours required for processing one unit of each product by the three machines is given by the following table:

	A	B	C
Ι	3	1	2
II	1	2	1
III	2	4	1

machine I is available for 440 hours, machine II for 310 hours, and machine III for 560 hours, then the number units of product B should be produced.

- (a) 86
- (b) 70
- (c) 74
- (d) 72
- (e) 78

- 11. A manufacturer of children's toy will break even a sales volume of \$200000. Fixed Cost are \$50000, and each unit of output sells for the \$4. Then, the variable cost per unit is
  - (a) \$3
  - (b) \$4
  - (c) \$5
  - (d) \$6
  - (e) \$2

12. The shaded region represents the feasible region in the following diagram is

- (a) x y < 1, y x < 1(b) x + y < 1, y - x < 1
- (c) x y < 1, y + x < 1
- (d) x 2y < 1, x y < 1
- (e) x + 2y < 1, y + x < 1



13. If Minimize z = x + ySubject to  $x - y \ge 0$  $4x + 3y \ge 12$  $9x + 11y \le 99$  $x, y \ge 0$ then z =(a) 3 (b) 2 (c) 1 (d) 0

(e) 4

14. Maximize c = 50x + 60ySubject to  $x - y \ge 0$  $100x + 200y \le 3000$  $200x + 50y \le 2500$  $x, y \ge 0$ If the optimal point is (x, y), then x - y

- (a) 0
- (b) 1
- (c) 2
- (d) 3
- (e) 4

## 15. The following system

$$x - 2y + z = 0$$
  

$$2x - y + 5z = 0$$
  

$$x + y + 4z = 0$$

has

- (a) a solution with one parameter
- (b) only one solution
- (c) no solution
- (d) a solution with two parameters
- (e) a solution with three parameters