

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**Solve the system of two equations in two variables.**

1) $x + 4y = 16$ 1) _____

$-3x + 5y = 20$

A) No solution

B) (0, 4)

C) (1, 3)

D) (-4, 0)

2) $4x + 6y = 2$ 2) _____

$20x + 30y = 10$

A) $(-1, 1)$ B) $\left(-\frac{3}{2}y + \frac{1}{2}, y\right)$ for any real number yC) $\left(\frac{1}{2}, 0\right)$

D) No solution

Write an augmented matrix for the system of equations.

3) $6x + 3y = 24$ 3) _____

$5y = 10$

A)

$\left[\begin{array}{cc|c} 6 & 3 & 24 \\ 5 & 10 & 0 \end{array}\right]$

B)

$\left[\begin{array}{cc|c} 6 & 3 & 24 \\ 0 & 5 & 10 \end{array}\right]$

C)

$\left[\begin{array}{cc|c} 24 & 3 & 6 \\ 10 & 0 & 5 \end{array}\right]$

D)

$\left[\begin{array}{cc|c} 5 & 0 & 10 \\ 6 & 3 & 3 \end{array}\right]$

Perform row operations on the augmented matrix as far as necessary to determine whether the system is independent, dependent, or inconsistent.

4) $x + y + z = 7$ 4) _____

$x - y + 2z = 7$

$2x + 3z = 14$

A) Inconsistent

B) Dependent

C) Independent

Solve the system of equations. If the system is dependent, express solutions in terms of the parameter z.

5) $x + y + z = -1$ 5) _____

$x - y + 2z = -8$

$2x + y + z = 2$

A) No solution

B) (-5, 3, 1)

C) (3, 1, -5)

D) (-5, 1, 3)

Use the Gauss-Jordan method to solve the system of equations.

6) $x + y + z = -6$ 6) _____

$x - y + 2z = -13$

$4x + y + z = -12$

A) (-5, 1, -2)

B) (-5, -2, 1)

C) No solution

D) (-2, 1, -5)

Solve the problem.

7) What is the size of the matrix? 7) _____

$\begin{bmatrix} 3 & -3 & 1 & 7 \end{bmatrix}$

A) 4

B) 4×1 C) 1×4

D) 1

Perform the indicated operation where possible.

$$8) \begin{bmatrix} -1 & 2 \\ 0 & 4 \\ 9 & -4 \end{bmatrix} - \begin{bmatrix} 2 & 1 \\ 7 & 4 \\ 3 & 2 \end{bmatrix}$$

8) _____

A)

$$\begin{bmatrix} 1 & 1 \\ 7 & 0 \\ 6 & -2 \end{bmatrix}$$

B)

$$\begin{bmatrix} 1 & 3 \\ 7 & 8 \\ 12 & 1 \end{bmatrix}$$

C)

$$\begin{bmatrix} 3 & -1 \\ 7 & 0 \\ -6 & 6 \end{bmatrix}$$

D)

$$\begin{bmatrix} -3 & 1 \\ -7 & 0 \\ 6 & -6 \end{bmatrix}$$

Perform the indicated operation.

$$9) \text{ Let } A = \begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix} \text{ and } B = \begin{bmatrix} 0 & 4 \\ -1 & 6 \end{bmatrix}. \text{ Find } 2A + B.$$

9) _____

A)

$$\begin{bmatrix} 4 & 10 \\ 1 & 10 \end{bmatrix}$$

B)

$$\begin{bmatrix} 4 & 14 \\ 2 & 20 \end{bmatrix}$$

C)

$$\begin{bmatrix} 4 & 10 \\ 3 & 14 \end{bmatrix}$$

D)

$$\begin{bmatrix} 4 & 7 \\ 3 & 10 \end{bmatrix}$$

Given the matrices A and B, find the matrix product AB.

$$10) A = \begin{bmatrix} 0 & -1 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} -2 & 0 \\ -1 & 1 \end{bmatrix} \text{ Find } AB.$$

10) _____

A)

$$\begin{bmatrix} -6 & -4 \\ 3 & 3 \end{bmatrix}$$

B)

$$\begin{bmatrix} 0 & 2 \\ -3 & 2 \end{bmatrix}$$

C)

$$\begin{bmatrix} 1 & -1 \\ -8 & 2 \end{bmatrix}$$

D)

$$\begin{bmatrix} -1 & 1 \\ -4 & -8 \end{bmatrix}$$

$$11) A = \begin{bmatrix} 1 & 3 & -1 \\ 2 & 0 & 5 \end{bmatrix}, B = \begin{bmatrix} 3 & 0 \\ -1 & 1 \\ 0 & 5 \end{bmatrix} \text{ Find } AB.$$

11) _____

A) AB is not defined.

B)

$$\begin{bmatrix} 0 & -2 \\ 6 & 25 \end{bmatrix}$$

C)

$$\begin{bmatrix} 3 & -3 & 0 \\ 0 & 0 & 25 \end{bmatrix}$$

D)

$$\begin{bmatrix} -2 & 0 \\ 25 & 6 \end{bmatrix}$$

Find the inverse, if it exists, of the given matrix.

$$12) A = \begin{bmatrix} 3 & 0 \\ -6 & 5 \end{bmatrix}$$

12) _____

A)

$$\begin{bmatrix} \frac{1}{5} & 0 \\ \frac{2}{5} & \frac{1}{3} \end{bmatrix}$$

B) No inverse

C)

$$\begin{bmatrix} \frac{1}{3} & 0 \\ -\frac{2}{5} & \frac{1}{5} \end{bmatrix}$$

D)

$$\begin{bmatrix} \frac{1}{3} & 0 \\ \frac{2}{5} & \frac{1}{5} \end{bmatrix}$$

Determine whether the two matrices are inverses of each other by computing their product.

13) $\begin{bmatrix} 6 & -5 \\ -3 & 5 \end{bmatrix}, \begin{bmatrix} \frac{1}{3} & \frac{1}{3} \\ \frac{1}{5} & \frac{2}{5} \end{bmatrix}$ 13) _____

A) Yes B) No

Perform the row operations on the matrix and write the resulting matrix.

14) Replace R_3 by $\frac{1}{2}R_1 + R_2$ 14) _____

$$\left[\begin{array}{ccc|c} 2 & 2 & 4 & 6 \\ 1 & -1 & -2 & 3 \\ 0 & 1 & 0 & 4 \end{array} \right]$$

A)

$$\left[\begin{array}{ccc|c} 1 & 1 & 2 & 3 \\ 0 & 1 & 0 & 3 \\ 2 & 0 & 0 & 6 \end{array} \right]$$

B)

$$\left[\begin{array}{ccc|c} 2 & 2 & 4 & 6 \\ 1 & -1 & -2 & 3 \\ 2 & 0 & 0 & 6 \end{array} \right]$$

C)

$$\left[\begin{array}{ccc|c} 1 & 1 & 2 & 3 \\ 2 & 0 & 0 & 6 \\ 0 & 1 & 0 & 4 \end{array} \right]$$

D)

$$\left[\begin{array}{ccc|c} 2 & 2 & 4 & 6 \\ 0 & 1 & 0 & 4 \\ 3 & 1 & 2 & 9 \end{array} \right]$$

Find the inverse, if it exists, of the given matrix.

15) $A = \begin{bmatrix} 2 & -5 \\ -5 & 0 \end{bmatrix}$ 15) _____

A)

$$\begin{bmatrix} -\frac{1}{5} & -\frac{2}{25} \\ 0 & -\frac{1}{5} \end{bmatrix}$$

B)

$$\begin{bmatrix} -\frac{2}{25} & -\frac{1}{5} \\ -\frac{1}{5} & 0 \end{bmatrix}$$

C)

$$\begin{bmatrix} 0 & \frac{1}{5} \\ \frac{1}{5} & -\frac{2}{25} \end{bmatrix}$$

D)

$$\begin{bmatrix} 0 & -\frac{1}{5} \\ -\frac{1}{5} & -\frac{2}{25} \end{bmatrix}$$

Find the x-intercepts and y-intercepts of the graph of the equation.

16) $2x + y = -10$ 16) _____

A) x-intercept: -4; y-intercept: -2

B) x-intercept: -5; y-intercept: -10

C) x-intercept: -2; y-intercept: -4

D) x-intercept: -10; y-intercept: -5

Find the slope of the line, if it is defined.

17) Through (2, -6) and (-1, 9) 17) _____

A) Undefined

B) -3

C) 15

D) -5

Write an equation in slope-intercept form of a line satisfying the given conditions.

18) $m = -\frac{2}{3}; b = 5$ 18) _____

A) $y = -\frac{2}{3}x - 5$

B) $y = \frac{2}{3}x - 5$

C) $y = -\frac{2}{3}x + 5$

D) $y = \frac{2}{3}x + 5$

Find the slope and the y-intercept of the line.

19) $2x - 3y = 16$ 19) _____

A) $m = -\frac{3}{2}; b = -3$

B) $m = -\frac{2}{3}; b = 16$

C) $m = \frac{3}{2}; b = -\frac{16}{3}$

D) $m = \frac{2}{3}; b = -\frac{16}{3}$

Find an equation of the line with slope m that passes through the given point. Put the answer in slope-intercept form.

20) $(5, 3)$, $m = -\frac{3}{4}$

20) _____

A) $y = -\frac{3}{4}x - \frac{27}{4}$

B) $y = -\frac{3}{4}x + \frac{27}{4}$

C) $y = \frac{3}{4}x + \frac{27}{4}$

D) $y = \frac{3}{4}x - \frac{27}{4}$

Write an equation in standard form for a line passing through the pair of points.

21) $(-5, 0)$ and $(5, -9)$

21) _____

A) $-5x + 14y = -101$

B) $9x - 10y = 45$

C) $5x - 14y = -101$

D) $-9x - 10y = 45$

Find an equation of the the line satisfying the given conditions.

22) Through $(4, 9)$; perpendicular to $6x + 8y = 96$

22) _____

A) $4x - 3y = -11$

B) $3x - 4y = -11$

C) $4x - 3y = 1$

D) $4x + 3y = -11$

23) Through $(2, 9)$; parallel to $8x + 7y = 65$

23) _____

A) $2x + 7y = 65$

B) $7x + 8y = 9$

C) $8x - 7y = 79$

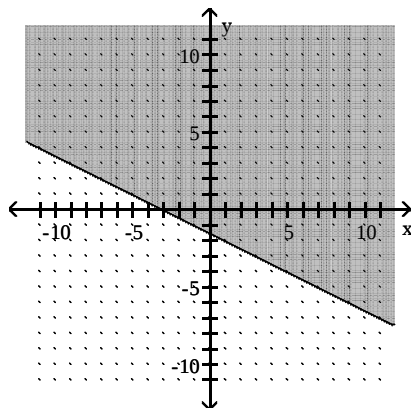
D) $8x + 7y = 79$

Graph the linear inequality.

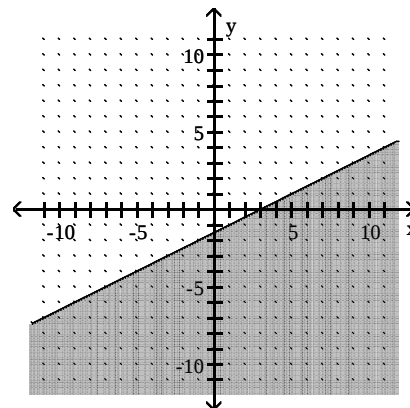
24) $x + 2y \geq -3$

24) _____

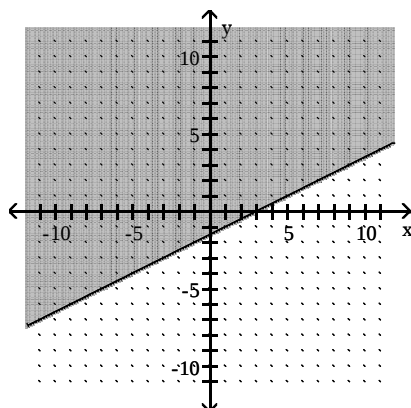
A)



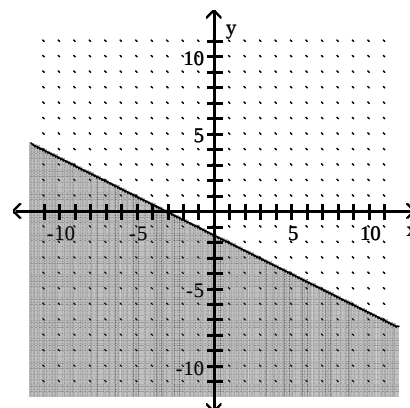
B)



C)



D)

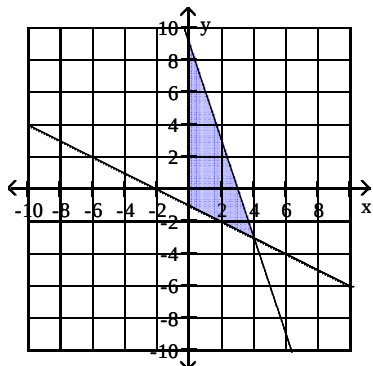


Graph the feasible region for the system of inequalities.

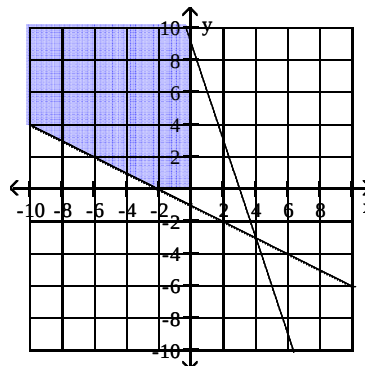
25) $2y + x \geq -2$
 $y + 3x \leq 9$
 $y \leq 0$
 $x \geq 0$

25) _____

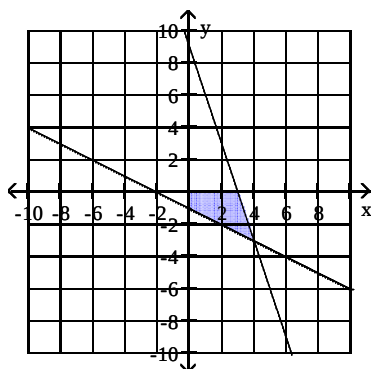
A)



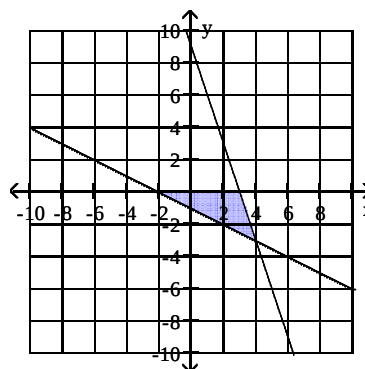
B)



C)



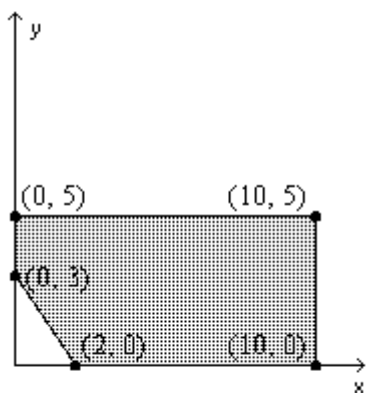
D)



Find the value(s) of the function on the given feasible region.

26) Find the maximum and minimum of $z = 17x + 9y$.

26) _____



A) 215, 27

B) 45, 27

C) 170, 27

D) 215, 170

Use graphical methods to solve the linear programming problem.

27) Maximize $z = 6x + 7y$
 subject to:
 $2x + 3y \leq 12$
 $2x + y \leq 8$
 $x \geq 0$
 $y \geq 0$

27) _____

- A) Maximum of 52 when $x = 4$ and $y = 4$
 C) Maximum of 24 when $x = 4$ and $y = 0$

- B) Maximum of 32 when $x = 3$ and $y = 2$
 D) Maximum of 32 when $x = 2$ and $y = 3$

28) Minimize $z = 6x + 8y$
 subject to:
 $2x + 4y \geq 12$
 $2x + y \geq 8$
 $x \geq 0$
 $y \geq 0$

28) _____

- A) Minimum of $\frac{92}{3}$ when $x = \frac{10}{3}$ and $y = \frac{4}{3}$

- B) Minimum of 0 when $x = 0$ and $y = 0$

- C) Minimum of 26 when $x = 3$ and $y = 1$

- D) Minimum of 36 when $x = 6$ and $y = 0$

State the linear programming problem in mathematical terms, identifying the objective function and the constraints.

- 29) A firm makes products A and B. Product A takes 2 hours each on machine L and machine M; product B takes 4 hours on L and 2 hours on M. Machine L can be used for 8 hours and M for 7 hours. Profit on product A is \$6 and \$7 on B. Maximize profit.

29) _____

- A) Maximize $6A + 7B$
 Subject to: $2A + 2B \leq 8$
 $2A + 4B \leq 7$
 $A, B \geq 0$.

- B) Maximize $6A + 7B$
 Subject to: $2A + 4B \leq 8$
 $2A + 2B \leq 7$
 $A, B \geq 0$.

- C) Maximize $7A + 6B$
 Subject to: $2A + 2B \leq 8$
 $2A + 4B \leq 7$
 $A, B \geq 0$.

- D) Maximize $6A + 7B$
 Subject to: $2A + 2B \geq 8$
 $2A + 4B \geq 7$
 $A, B \leq 0$.

The Acme Class Ring Company designs and sells two types of rings: the VIP and the SST. They can produce up to 24 rings each day using up to 60 total man-hours of labor. It takes 3 man-hours to make one VIP ring, versus 2 man-hours to make one SST ring.

- 30) How many of each type of ring should be made daily to maximize the company's profit, if the profit on a VIP ring is \$30 and on an SST ring is \$40?

30) _____

- A) 8 VIP and 16 SST
 C) 16 VIP and 8 SST

- B) 12 VIP and 12 SST
 D) 0 VIP and 24 SST

Answer Key

Testname: REVIEW 3(1324-2019-CHAP 6&SEC2.1,2.2,7.1.7.2,7.3)

- 1) B
- 2) B
- 3) B
- 4) B
- 5) C
- 6) D
- 7) C
- 8) D
- 9) C
- 10) C
- 11) B
- 12) D
- 13) A
- 14) B
- 15) D
- 16) B
- 17) D
- 18) C
- 19) D
- 20) B
- 21) D
- 22) A
- 23) D
- 24) A
- 25) C
- 26) A
- 27) B
- 28) A
- 29) B
- 30) D