

Name Answer Key

Solve using the elimination method.

1. $3x + 5y = -41$
 $x + 9y = -65$ $(-2, -7)$

$$\begin{array}{r} 3x + 5y = -41 \\ -3x - 27y = 195 \\ \hline -22y = 154 \\ y = -7 \end{array}$$

$$\begin{array}{l} x + 9(-7) = -65 \\ x - 63 = -65 \\ x = -2 \end{array}$$

2. $5x + 4y = 67$
 $2x - 8y = -2$ $(11, 3)$

$$\begin{array}{r} 10x + 8y = 134 \\ 2x - 8y = -2 \\ \hline 12x = 132 \\ x = 11 \end{array}$$

$$\begin{array}{l} 2(11) - 8y = -2 \\ 22 - 8y = -2 \\ -8y = -24 \\ y = 3 \end{array}$$

Solve using Cramer's Rule.

3. $3x + 2y = 6$
 $5x - 10y = -110$

Matrix A $\begin{bmatrix} 3 & 2 \\ 5 & -10 \end{bmatrix}$ $\det A = -30 - 10 = -40$

$$x = \frac{\begin{vmatrix} 6 & 2 \\ -110 & -10 \end{vmatrix}}{-40} = \frac{-60 + 220}{-40} = \frac{160}{-40} = -4$$

$$y = \frac{\begin{vmatrix} 3 & 6 \\ 5 & -110 \end{vmatrix}}{-40} = \frac{-330 - 30}{-40} = \frac{-360}{-40} = 9$$

$(-4, 9)$

4. $9x + 7y = 46$
 $-3x - 12y = -54$

Matrix A $\begin{bmatrix} 9 & 7 \\ -3 & -12 \end{bmatrix}$ $\det A = -108 + 21 = -87$

$$x = \frac{\begin{vmatrix} 46 & 7 \\ -54 & -12 \end{vmatrix}}{-87} = \frac{-552 + 378}{-87} = \frac{-174}{-87} = 2$$

$$y = \frac{\begin{vmatrix} 9 & 46 \\ -3 & -54 \end{vmatrix}}{-87} = \frac{-486 + 138}{-87} = \frac{-348}{-87} = 4$$

$(2, 4)$

Write a system of equations to represent this scenario. Solve using the method of your choice (elimination or Cramer's Rule).

5. Wayne Deer purchased 5 rolls of wrapping paper^x and 3 packs of bows^y at Target for \$33.50. Two weeks later he purchased 7 rolls of wrapping paper and 1 pack of bows (at the same prices) for \$36.50. Find the cost of a roll of wrapping paper and a pack of bows.

$$\begin{aligned} 5x + 3y &= 33.50 \\ 7x + 1y &= 36.50 \end{aligned}$$

$$\begin{aligned} 5x + 3y &= 33.50 \\ -21x - 3y &= -109.50 \\ \hline \end{aligned}$$

$$-16x = -76$$

$$x = \$4.75 \text{ for wrapping paper}$$

$$7(4.75) + y = 36.50$$

$$33.25 + y = 36.50$$

$$y = \$3.25 \text{ for a pack of bows}$$

Graph the system of linear inequalities.

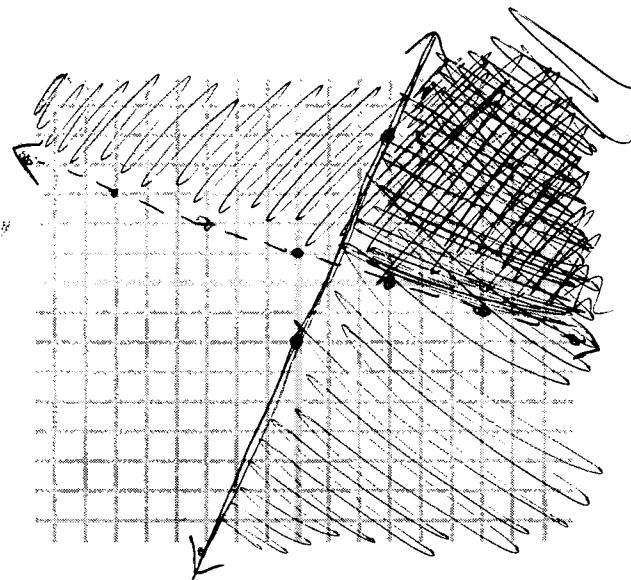
6. $y > -\frac{1}{3}x + 1$

$$y \leq \frac{7}{3}x - 2$$

State two points that fall within the solution set:

$$(3, 2)$$

$$(4, 4)$$



Chapter 3 : Linear Systems and Matrices
Study Guide for Test ch3

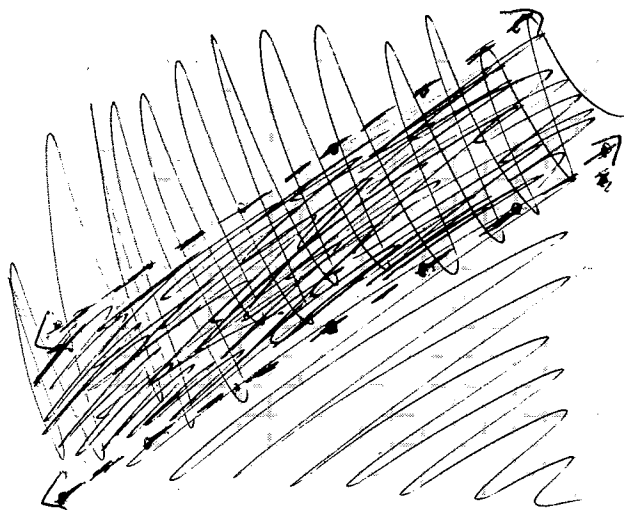
7. $y < \frac{2}{3}x + 3$

$y > \frac{2}{3}x - 3$

State two points that
fall within the solution
set:

(0 , 0)

(1 , 1)



Solve using the elimination method.

8. $x - 8y + 2z = -39$

$3x + 3y - 5z = 23$

$x - 7y + z = -35$

$$\begin{array}{rcl} \begin{array}{l} *1 \rightarrow x - 8y + 2z = -39 \\ -x + 7y - z = 35 \\ \hline -y + z = -4 \end{array} & \begin{array}{l} *3 \rightarrow 3x + 3y - 5z = 23 \\ -3x + 24y - 6z = 117 \\ \hline 27y - 11z = 140 \\ *27 \rightarrow -27y + 27z = -108 \\ \hline 16z = 32 \\ z = 2 \end{array} & \end{array}$$

(5, 6, 2)

$-y + z = -4$

$-y = -6$

$y = 6$

$x - 7(6) + (2) = -35$

$x - 42 + 2 = -35$

$x - 40 = -35$

$x = 5$

Chapter 3 : Linear Systems and Matrices
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Use the following matrices for #9 – 13.

$$A = \begin{bmatrix} 1 & -2 \\ 9 & 6 \end{bmatrix}$$

$$B = \begin{bmatrix} 2 & -5 \\ 0 & 3 \end{bmatrix}$$

$$C = \begin{bmatrix} 3 & -3 & 1 \\ -2 & 4 & 2 \end{bmatrix}$$

9. $A - B$

$$\begin{bmatrix} 1-2 & -2-5 \\ 9-0 & 6-3 \end{bmatrix} = \begin{bmatrix} -1 & -7 \\ 9 & 3 \end{bmatrix}$$

10. $-3(A + B)$

$$-3 \begin{bmatrix} 3 & -7 \\ 9 & 9 \end{bmatrix} = \begin{bmatrix} -9 & 21 \\ -27 & -27 \end{bmatrix}$$

11. AB

$$\begin{bmatrix} 1 & -2 \\ 9 & 6 \end{bmatrix} \begin{bmatrix} 2 & -5 \\ 0 & 3 \end{bmatrix} = \begin{bmatrix} 2+0 & -5-6 \\ 18+0 & -45+18 \end{bmatrix}$$

$$= \begin{bmatrix} 2 & -11 \\ 18 & -27 \end{bmatrix}$$

12. BC

$$\begin{bmatrix} 2 & -5 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} 3 & -3 & 1 \\ -2 & 4 & 2 \end{bmatrix}$$

$$= \begin{bmatrix} 6+10 & -6-20 & 2-10 \\ 0-6 & 0+12 & 0+6 \end{bmatrix}$$

$$= \begin{bmatrix} 16 & -26 & -8 \\ -6 & 12 & 6 \end{bmatrix}$$

13. $BC + 5C$

already done

$$\begin{bmatrix} 16 & -26 & -8 \\ -6 & 12 & 6 \end{bmatrix} + \begin{bmatrix} 15 & -15 & 5 \\ -10 & 20 & 10 \end{bmatrix}$$

$$= \begin{bmatrix} 31 & -41 & -3 \\ -16 & 32 & 16 \end{bmatrix}$$