

Chapter 3 Test

Form A

Name _____

(Page 1 of 3 pages)

Date _____

Use a straight edge to draw straight lines.

1. Are there none, one, or many solutions to the system?

$$\begin{cases} (x - 4y = 2) \cdot 2 & 2x - 8y = 4 \\ 2x - 8y = 5 & 2x - 8y = 5 \end{cases}$$

1. NONE

2. Is (5, -2) a solution of the system?

$$\begin{cases} 2x + 6y = -2 \\ (x + 2y = 1) \cdot 2 \end{cases}$$

$$x + 2(-2) = 1$$

$$x - 4 = 1$$

$$x = 5$$

$$\begin{aligned} 2x + 6y &= -2 \\ -2x - 4y &= -2 \\ \hline 2y &= -4 \\ y &= -2 \end{aligned}$$

2. YES

SOLUTION (5, -2) YES

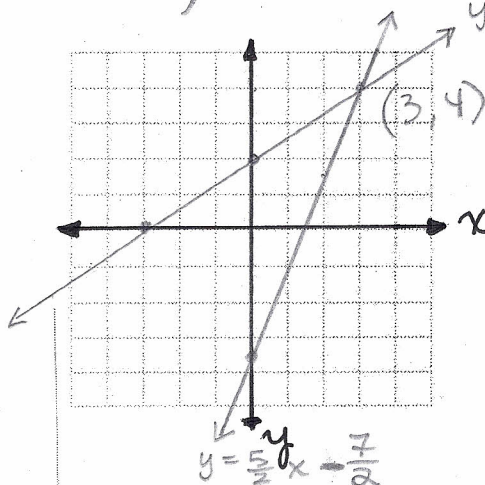
3. Sketch the graph of the system.

Estimate the solution.

$$\begin{cases} 2x - 3y + 6 = 0 \\ 5x - 2y - 7 = 0 \end{cases}$$

$$\begin{aligned} -3y &= -2x - 6 \\ y &= \frac{2}{3}x + 2 \end{aligned}$$

$$\begin{aligned} -2y &= -5x + 7 \\ y &= \frac{5}{2}x - \frac{7}{2} \end{aligned}$$



3. (3, 4)
Use graph at left.

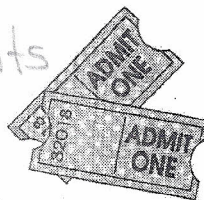
4. **Theater Tickets** 1500 theater tickets were sold for a performance.

General admission was \$12 but student rates offered a 50% discount.

Box office receipts totaled \$16,200. How many students attended?

$$\begin{aligned} -12(x + y &= 1500) \\ 12x + 6y &= 16,200 \\ -12x - 12y &= -18,000 \\ \hline -6y &= -1,800 \\ y &= 300 \end{aligned}$$

x = general
y = students



4. y = 300 students

5. Solve the system.

$$\begin{cases} y = -4x + 4 \\ y = -x - 5 \end{cases}$$

$$\begin{aligned} y &= -3 - 5 \\ y &= -8 \end{aligned}$$

$$\begin{aligned} y &= -4x + 4 \\ -y &= x + 5 \\ \hline 0 &= -3x + 9 \\ 3x &= 9, \quad x = 3 \end{aligned}$$

5. (3, -8)

Chapter 3 Test

Form A

(Page 2 of 3 pages)

Name _____

6. Solve the linear system.

$$\begin{array}{r} 3 * | 4x - 3y = -1 \\ - 4 * | 3x + 4y = -3 \end{array}$$

$$12x - 9y = -3$$

$$-12x - 16y = 12$$

$$-25y = 9$$

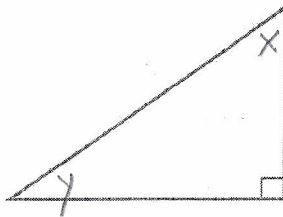
$$y = -\frac{9}{25}$$

$$x = \frac{-25}{25} + \frac{12}{25} = -\frac{13}{25} = x$$

$$6. \left(-\frac{13}{25}, -\frac{9}{25} \right)$$

$$(-.52, -.36)$$

7. **Geometry** The measures of the two acute angles of a right triangle differ by 19° . What are their measures?



$$x + y = 90$$

$$x - y = 19$$

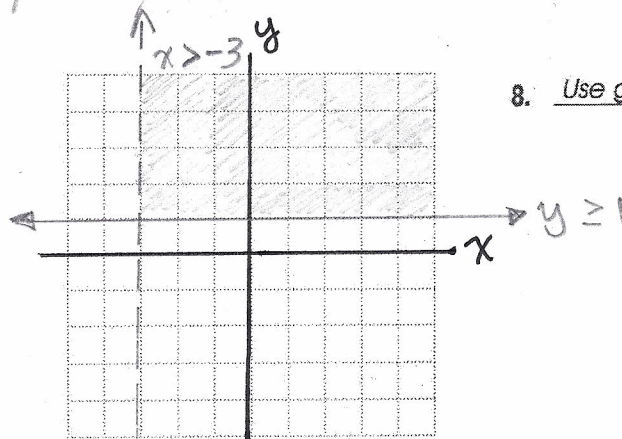
$$\begin{array}{r} 2x = 109 \\ x = 54.5^\circ \end{array}$$

$$y = 90 - 54.5^\circ = 35.5^\circ$$

$$7. x = 54.5^\circ \quad y = 35.5^\circ$$

8. Sketch the graph of the system of linear inequalities.

$$\begin{cases} x > -3 \\ y \geq 1 \end{cases}$$



8. Use graph at left.

9. Sketch the graph of the system described.

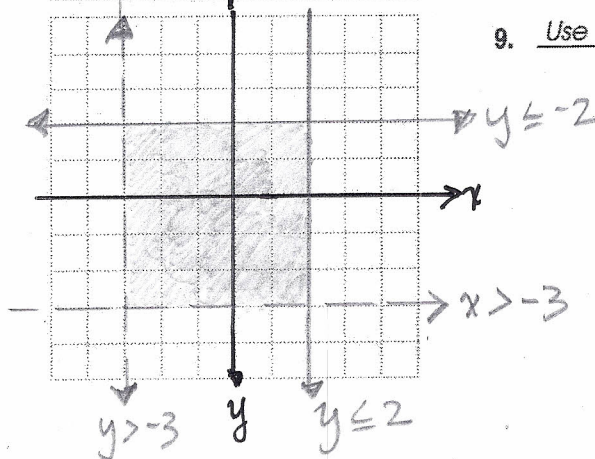
"x and y are each greater than -3 but not greater than 2."

$$x > -3$$

$$y > -3$$

$$x \leq 2$$

$$y \leq 2$$



9. Use graph at left.

easier if you translate first



Chapter 3 Test

Form A

(Page 3 of 3 pages)

Name _____

10. Sketch the graph of the system of linear inequalities.

$$\begin{cases} y \leq \frac{1}{2}x + 2 \\ y \geq -\frac{1}{2}x - 2 \\ x \leq 3 \end{cases}$$

Label the vertices.

$$y = -\frac{1}{2}(3) - 2 = -\frac{3}{2} - \frac{4}{2} = -\frac{7}{2}$$

$$y = \frac{1}{2}(3) + 2 = \frac{3}{2} + \frac{4}{2} = \frac{7}{2}$$

11. Find the maximum value of C under the constraints.

$$C = -2x + 3y$$

Constraints:

$$\begin{cases} x \geq -4 \\ x \leq 3 \\ y \geq -1 \\ y \leq 2 \end{cases}$$

$$C = -2(-4) + 3(2) = 14$$

$$C = -2(-1) + 3(-1) = -2$$

$$C = -2(3) + 3(2) = 0$$

$$C = -2(3) + 3(-1) = -9$$

12. Solve the linear system.

$$\begin{cases} \text{EQ1} & x + 2y - 4z = -12 \\ \text{EQ2} & -x + z = 1 \\ \text{EQ3} & x + y + z = 4 \end{cases}$$

STEP 2 EQ1 + EQ3 (*-1)

$$\begin{array}{r} x + 2y - 4z = -12 \\ -x - y - z = -4 \\ \hline -2y - 5z = -16 \end{array}$$

$$-2 * (y - 5z = -16) \quad \text{New EQ3}$$

STEP 5 Plug $x \approx z$ into EQ3, solve for y

$$2 + y + 3 = 4 \quad \boxed{y = -1}$$

STEP 1 EQ1 + EQ2

$$\begin{array}{r} x + 2y - 4z = -12 \\ -x + z = 1 \\ \hline 2y - 3z = -11 \end{array}$$

$$\begin{array}{r} 2y - 3z = -11 \quad \text{New EQ2} \\ -2y + 10z = +32 \quad \text{New EQ3} \\ \hline 7z = 21 \end{array}$$

$$\boxed{z = 3}$$

plug into old eq. 2 STEP 4

$$-x + 3 = 1$$

$$x - 3 = 1$$

$$\boxed{x = 2}$$

12. $\boxed{(2, -1, 3)}$

