Mid-Chapter Quiz: Lessons 3-1 through 3-4

Solve each system of equations.

1. $2x - 3y = 9$
   $4x + 3y = 9$

   ANSWER:
   $(3, -1)$

2. $x + 2y = 7$
   $y = 5x - 2$

   ANSWER:
   $(1, 3)$

3. $-x + y = 2$
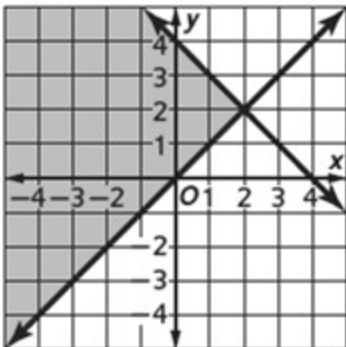 $4x - 3y = -3$

   ANSWER:
   $(3, 5)$

4. $\dfrac{1}{2}x + \dfrac{1}{3}y = 7$
   $\dfrac{1}{5}x - \dfrac{2}{3}y = -2$

   ANSWER:
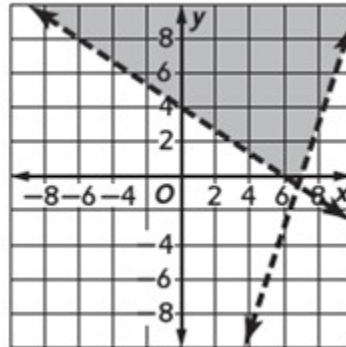 $(10, 6)$

Solve each system of inequalities by graphing.
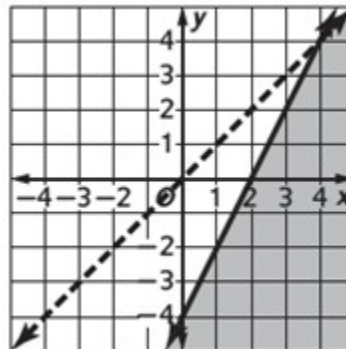
5. $x + y \le 4$
   $y \ge x$

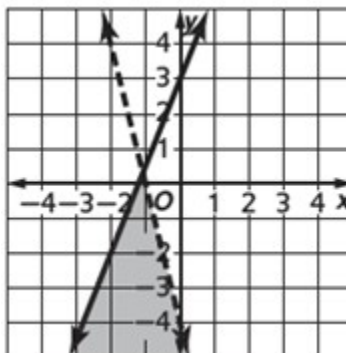   *ANSWER:*

6. $2x + 3y > 12$
   $3x - y < 21$

   ANSWER:

7. $x - y > 0$
   $4 + y \le 2x$

   ANSWER:

8. $2y - 5x \le 6$
   $4x + y < -4$

   ANSWER:

9. **MULTIPLE CHOICE** Which statement best describes the graphs of the two equations?

$x + 4y = 8$
$3x + 12y = 2$

A The lines are parallel.

B The lines are the same.

C The lines intersect in only one point.

D The lines intersect in more than one point, but are not the same.

ANSWER:

A

Solve each system of equations.

10. $x - 2y + 3z = 1$
$4y - 4z = 12$
$8y - 14z = 0$

ANSWER:

(3, 7, 4)

11. $x + y + z = 4$
$x + 3y + 3z = 10$
$2x + y - z = 3$

ANSWER:

(1, 2, 1)

12. $2x - y - 2z = 5$
$10x + 8z = -4$
$3x - y = 1$

ANSWER:

(2, 5, -3)

13. $2x + 3y + z = 0$
$3x + y = 1$
$x - 2y + z = 9$

ANSWER:

(1, -2, 4)

14. **MULTIPLE CHOICE** Seela rented a raft from River Rafter's Inc. She paid $100 to rent the raft and $25 for each hour. Martin rented a raft from Oscar's Outdoor Shop. He paid $50 to rent the raft and $35 per hour. For what number of hours will both rafting companies charge the same amount?

F 0

G 4

H 5

J 10

ANSWER:

H

Mid-Chapter Quiz: Lessons 3-1 through 3-4

15. **CARPENTRY** Cal's Carpentry makes tables and chairs. The process involves some carpentry time and some finishing time. The carpentry times and finishing times are listed in the table below.

| Product	Carpentry Time (hr)	Finishing Time (hr)
chair	3	0.5
table	2	1

Cal's Carpentry can work for a maximum of 108 carpentry hours and 20 finishing hours per day. The profit is $35 for a table and $25 for a chair. How many tables and chairs should be made each day to maximize profit?

a. Using c for the number of chairs and t for the number of tables, write a system of inequalities to represent this situation.

b. Draw the graph showing the feasible region.

c. Determine the number of tables and chairs that need to be made to maximize profit. What is the maximum profit?

ANSWER:

a. $c \geq 0; t \geq 0; 3c + 2t \leq 108; 0.5c + t \leq 20$

b.
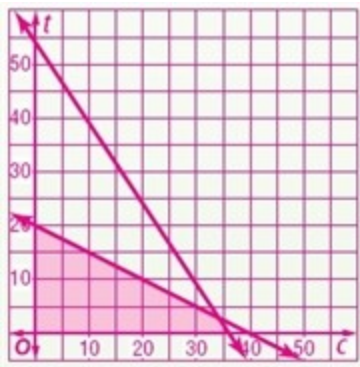
c. 34 chairs and 3 tables will give a maximum profit of $955.

16. **DRAMA** On opening night of the drama club's play, they made $1366. They sold a total of 199 tickets. They charged $8.50 for each adult ticket and $5.00 for each child's ticket. Write a system of equations that can be used to find the number of adult tickets and the number of children's tickets sold.

ANSWER:

$a + c = 199$
$8.50a + 5.00c = 1366$

Graph each system of inequalities. Name the coordinates of the vertices of the feasible region. Find the maximum and the minimum values of the given function.
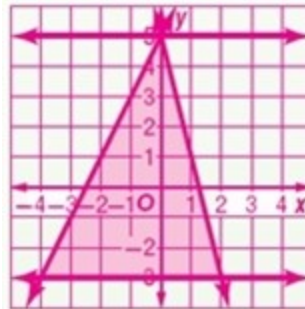
17.
$5 \geq y \geq -3$
$4x + y \leq 5$
$-2x + y \leq 5$
$f(x, y) = 4x - 3y$

ANSWER:

vertices: $(-4, -3)$, $(0, 5)$, $(2, -3)$; max:$f(2, -3) = 17$; min:$f(0, 5) = -15$
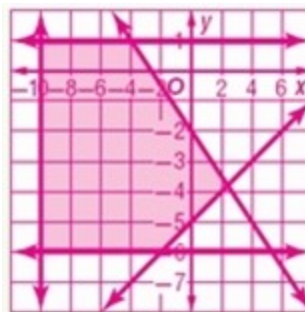
18.
$x \geq -10$
$1 \geq y \geq -6$
$3x + 4y \leq -8$
$2y \geq x - 10$
$f(x, y) = 2x + y$

ANSWER:

vertices: $(-10, 1)$, $(-4, 1)$, $(2.4, -3.8)$, $(-2, -6)$, $(-10, -6)$;
max:$f(2.4, -3.8) = 1$; min:$f(-10, -6) = -26$

19. **GEOMETRY** An isosceles trapezoid has shorter base of measure a, longer base of measure c, and congruent legs of measure b. The perimeter of the trapezoid is 58 inches. The average of the bases is 19 inches and the longer base is twice the leg plus 7.

     a. Find the lengths of the sides of the trapezoid.

     b. Find the area of the trapezoid.

     ANSWER:

     a. $a = 11$ in., $b = 10$ in., $c = 27$ in.

     b. 114 in^2