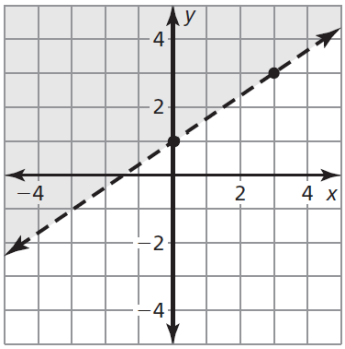
Chapter 5 - Solving Systems of Linear Equations

1. Which inequality is represented by the graph?



a. $y \geq \frac{2}{3}x + 1$ b. $y \leq \frac{2}{3}x + 1$ c. $y > \frac{2}{3}x + 1$ d. $y < \frac{2}{3}x + 1$

ANS: C REF: Ch 4-5 Cumulative Test NOT: Exercise 12

Solve the system of linear equations. Check your solution.

2. $y = -x + 30$

$y = x + 6$

a. (12, 18)
b. (13, 17)
c. (10, 16)
d. (11, 19)

ANS: A REF: Algebra 1 Sec. 5.1
KEY: system of linear equations | solution of a system of linear equations | solving systems of linear equations by graphing | solving systems of linear equations
NOT: Example 2

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

$-7x - y = -9$

a. (1, 9)
b. (2, 3)
c. (0, 9)
d. (1, 2)

ANS: D REF: Algebra 1 Sec. 5.1
KEY: system of linear equations | solution of a system of linear equations | solving systems of linear equations by graphing | solving systems of linear equations
NOT: Example 2

4. $-2x - 2y = -8$

   $3x + 6y = 21$

   a. $(14, -3)$
   b. $(-14, 3)$
   c. $(-1, -3)$
   d. $(1, 3)$

   ANS: D REF: Algebra 1 Sec. 5.2
   KEY: solving systems of linear equations by substitution | system of linear equations | solving systems of linear equations NOT: Example 2

5. $6x + 9y = -6$

   $-6x - 9y = -6$

   a. infinitely many solutions
   b. (5, 4)
   c. (5, −4)
   d. no solution

   ANS: D REF: Algebra 1 Sec. 5.4
   KEY: solving systems of linear equations | no solution | system of linear equations
   NOT: Example 1

6. $-2x - 2y = -6$

   $-x - y = -3$

   a. (8, −5)
   b. infinitely many solutions
   c. no solution
   d. (3, 0)

   ANS: B REF: Algebra 1 Sec. 5.4
   KEY: solving systems of linear equations | infinitely many solutions | system of linear equations
   NOT: Example 2

7. The members of the boosters organization at your high school bought new balls for the school. They spent $24.00 per basketball and $33.00 per football, spending a total of $882.00. They bought 6 more footballs than basketballs. How many of each type of ball did they buy?
   a. 12 basketballs and 18 footballs
   b. 13 basketballs and 7 footballs
   c. 7 basketballs and 13 footballs
   d. 18 basketballs and 12 footballs

   ANS: A REF: Algebra 1 Sec. 5.2
   KEY: application | solving systems of linear equations | writing systems of linear equations
   NOT: Example 3-1

8. Your school is planning a field trip to the zoo. There are two different bus companies that the school can use. Bus company A has a $35 rental fee plus $5 for each student. Bus company B has a $95 rental fee plus $3 for each student. How many students will need to go in order for the bus to cost the same from both companies?

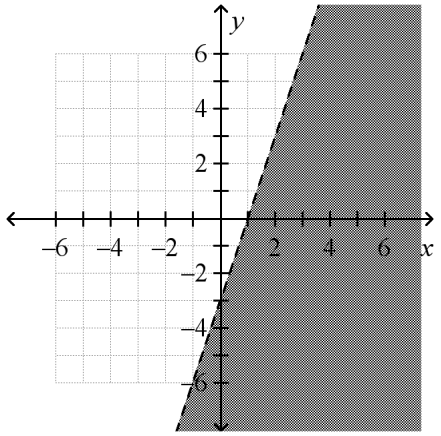
a. 27 students
b. 30 students
c. 65 students
d. 68 students

ANS: B REF: Algebra 1 Sec. 5.5
KEY: application | system of linear equations NOT: Example 3-1

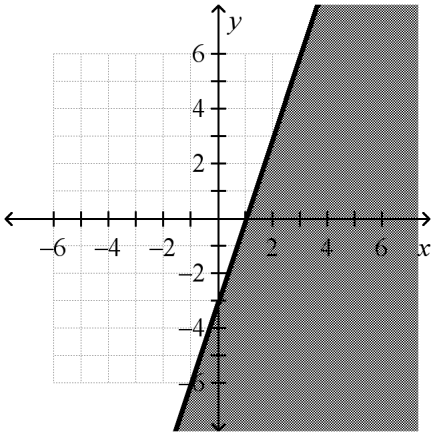
Graph the inequality in a coordinate plane.

9. $y < 3x - 3$

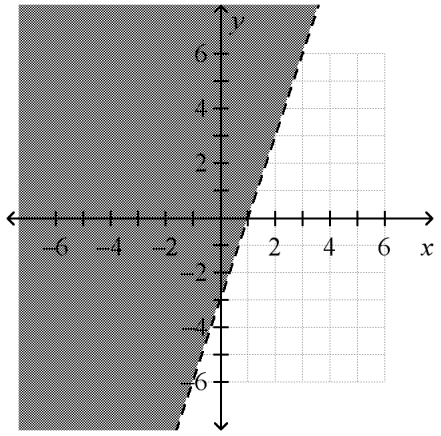
a.



c.



b.



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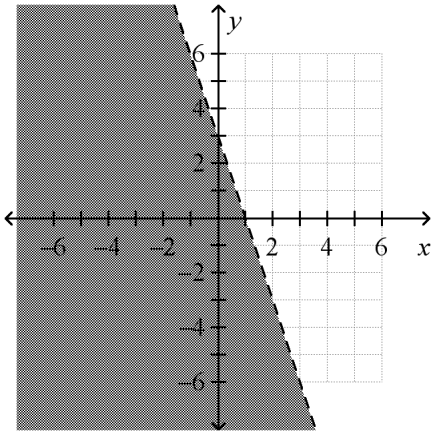
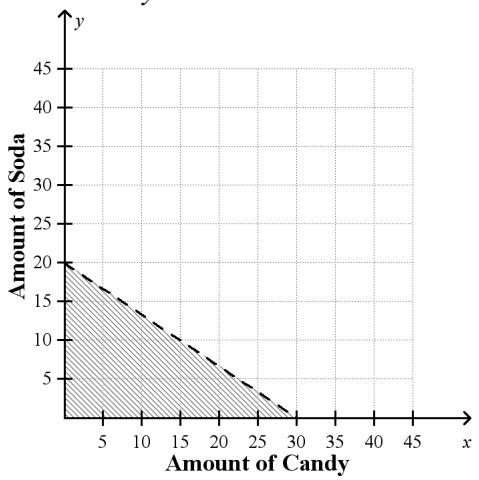


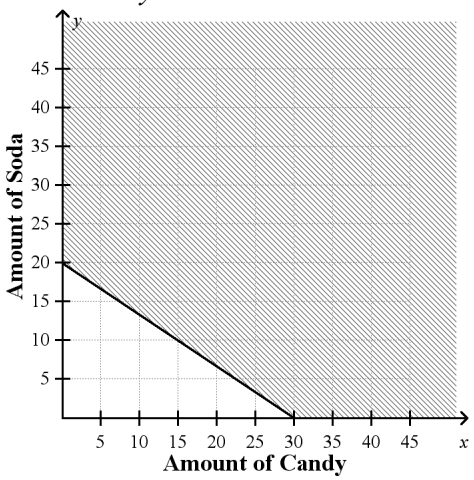
ANS: A REF: Algebra 1 Sec. 5.6
KEY: linear inequality in two variables | graph of a linear inequality in two variables
NOT: Example 3

10. You have \$30 to spend on candy and soda. Candy is \$1.00 and soda is \$1.50. Assume x represents the amount of candy and y is the amount of sodas purchased. Write and graph the inequality.

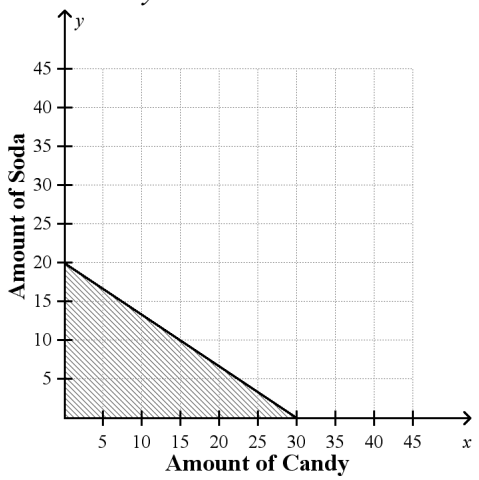
a. $1.00x + 1.50y < 30$



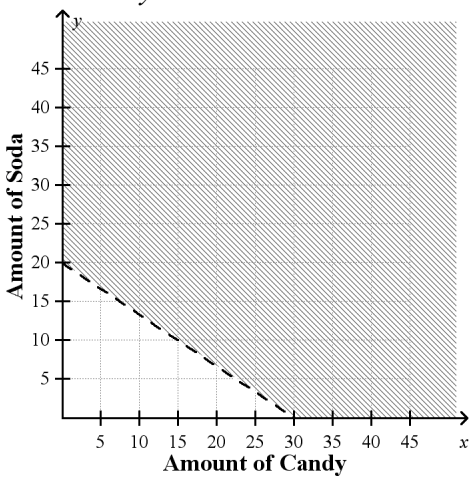
c. $1.00x + 1.50y \geq 30$



b. $1.00x + 1.50y \leq 30$



d. $1.00x + 1.50y > 30$



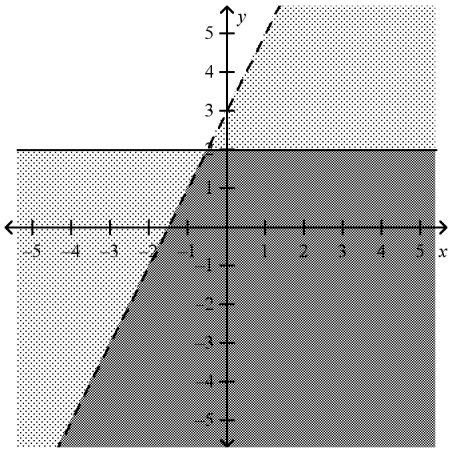
ANS: B REF: Algebra 1 Sec. 5.6
KEY: application | linear inequality in two variables | graph of a linear inequality in two variables | writing linear inequalities in two variables NOT: Example 4-1

Graph the system of linear inequalities.

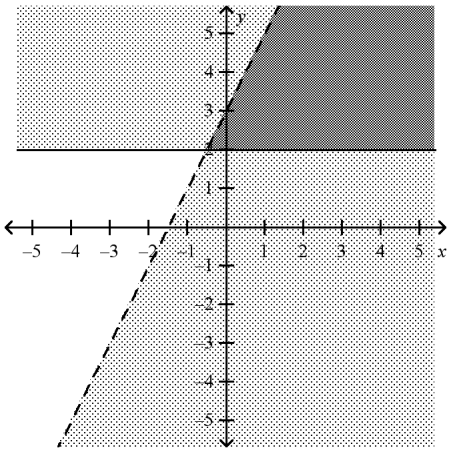
11. $y \geq 2$

$y < 2x + 3$

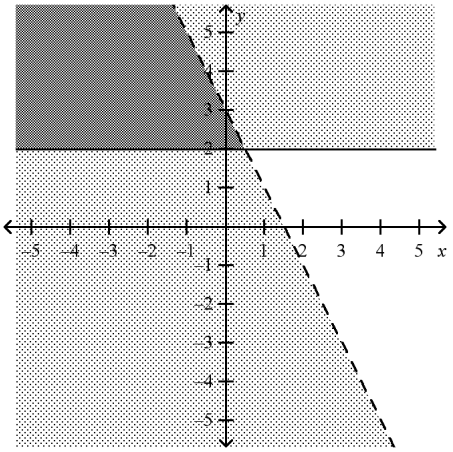
a.



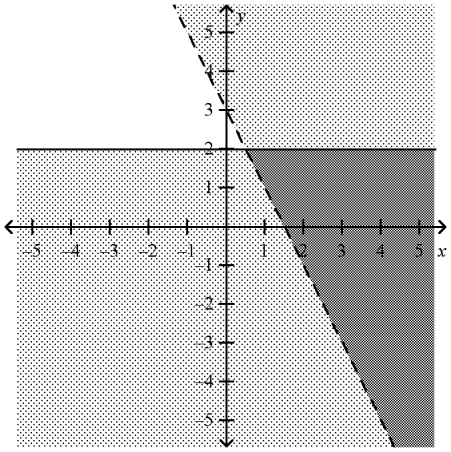
c.



b.



d.

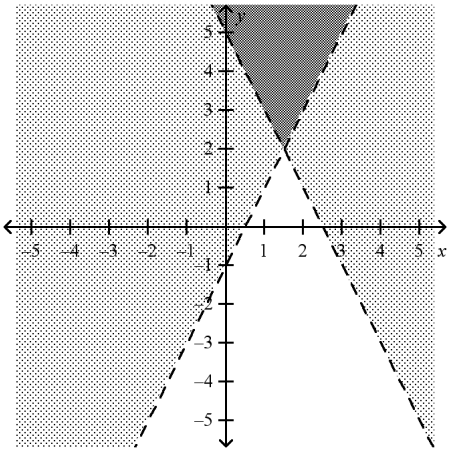


ANS: C REF: Algebra 1 Sec. 5.7
KEY: system of linear inequalities | graph of a system of linear inequalities | graphing systems of linear inequalities NOT: Example 2

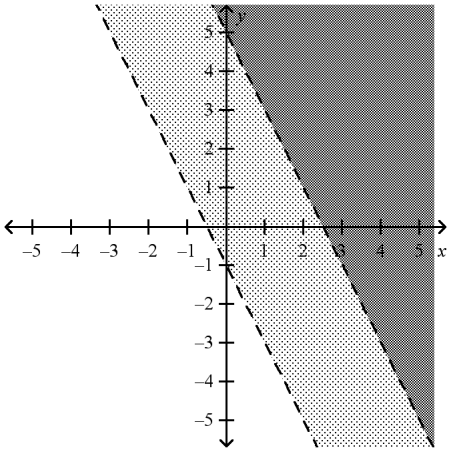
12. $2x + y > 5$

$-4x - 2y < 2$

a.



c.



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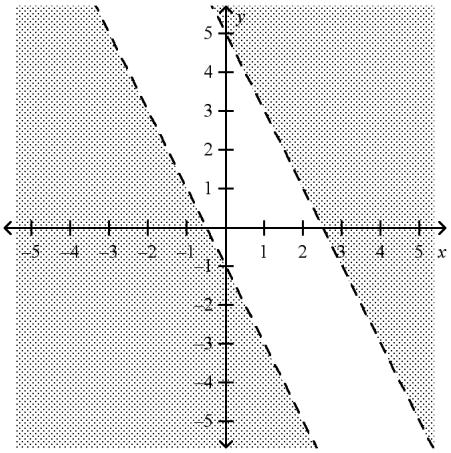
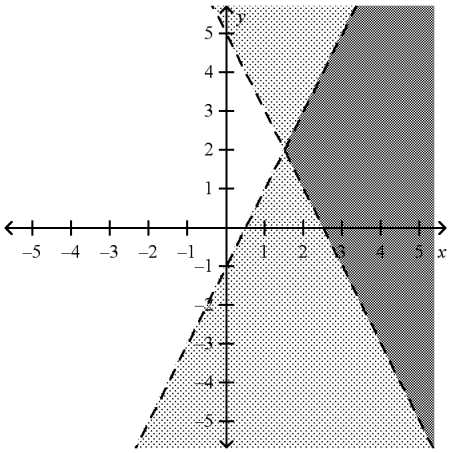


d.

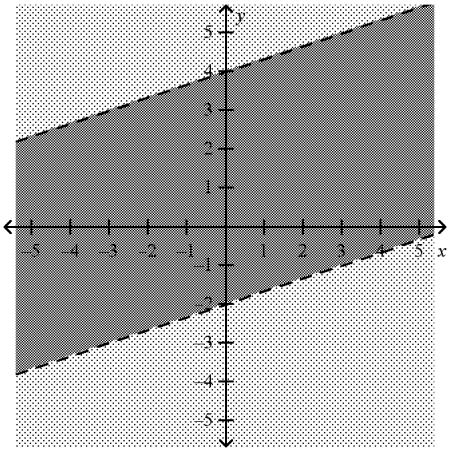


ANS: C REF: Algebra 1 Sec. 5.7
KEY: system of linear inequalities | graph of a system of linear inequalities | graphing systems of linear inequalities NOT: Example 2

13. $x - 3y < 6$

$2x > 6y - 24$

a.



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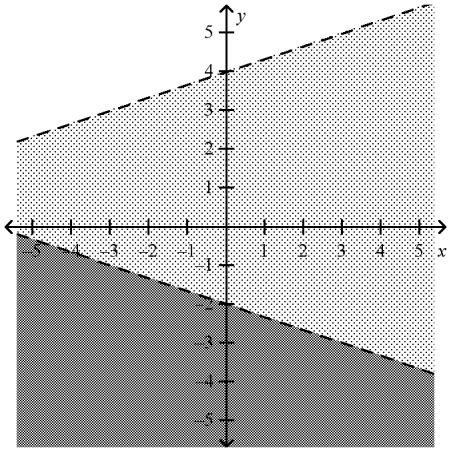

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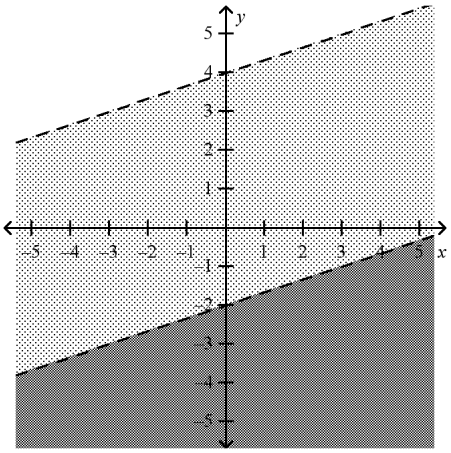
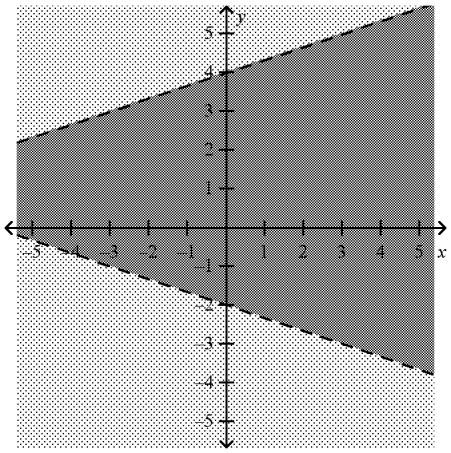
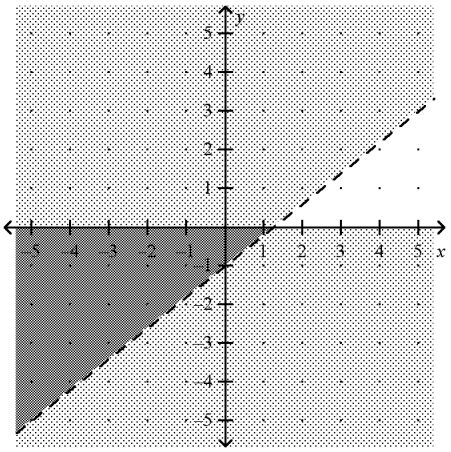


d.



ANS: A REF: Algebra 1 Sec. 5.7
KEY: system of linear inequalities | graph of a system of linear inequalities | graphing systems of linear inequalities NOT: Example 2

Write a system of linear inequalities represented by the graph.

14. 

a. $y > \frac{4}{5}x - 1$

$y \leq 0$

b. $y < \frac{4}{5}x - 1$

$y > 0$

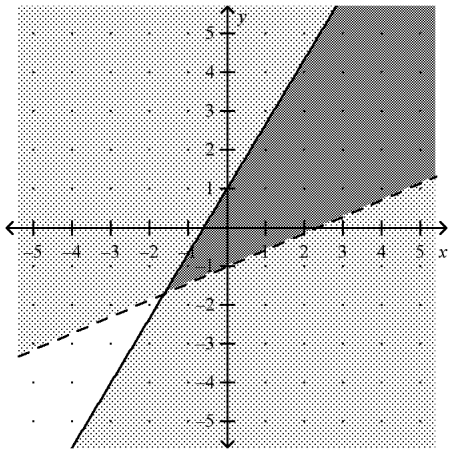
c. $y > -\frac{4}{5}x - 1$

$y \leq 0$

d. $y \leq \frac{4}{5}x - 1$

$y > 0$

ANS: A REF: Algebra 1 Sec. 5.7
KEY: system of linear inequalities | graph of a system of linear inequalities | writing systems of linear inequalities NOT: Example 4

15. 

a. $y \le \frac{5}{3}x + 1$

$y > \frac{3}{7}x - 1$

b. $y \ge \frac{5}{3}x + 1$

$y < \frac{3}{7}x - 1$

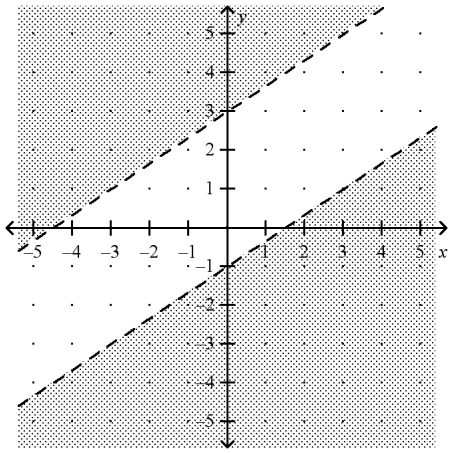
c. $y \le \frac{3}{5}x + 1$

$y > \frac{3}{7}x - 1$

d. $y \ge \frac{3}{5}x + 1$

$y < \frac{3}{7}x - 1$

ANS: A REF: Algebra 1 Sec. 5.7
KEY: system of linear inequalities | graph of a system of linear inequalities | writing systems of linear inequalities NOT: Examples 4 and 5

16. 

a. $y > \frac{2}{3}x + 3$

$y < \frac{2}{3}x - 1$

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

$y > \frac{2}{3}x - 1$

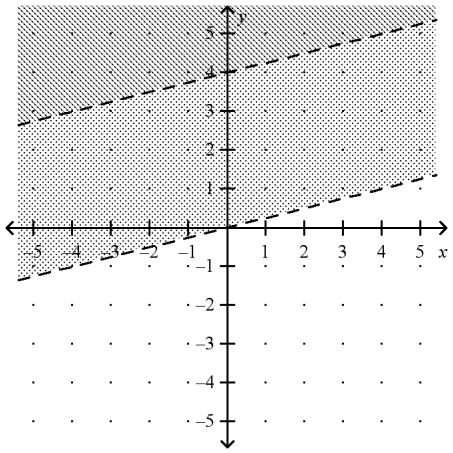
c. $y > -\frac{2}{3}x + 3$

$y < -\frac{2}{3}x - 1$

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

$y > -\frac{2}{3}x - 1$

ANS: A REF: Algebra 1 Sec. 5.7
KEY: system of linear inequalities | graph of a system of linear inequalities | writing systems of linear inequalities NOT: Examples 4 and 5

17. 

a. $y > -\frac{1}{4}x + 4$

$y < -\frac{1}{4}x$

b. $y < -\frac{1}{4}x + 4$

$y > -\frac{1}{4}x$

c. $y < \frac{1}{4}x + 4$

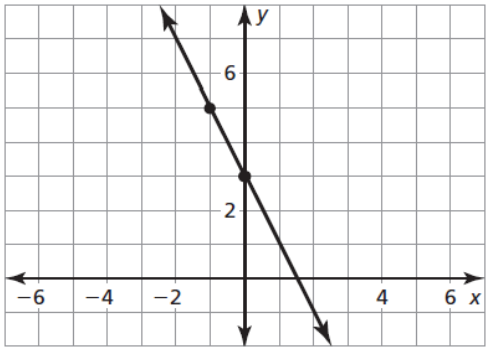
$y > \frac{1}{4}x$

d. $y > \frac{1}{4}x + 4$

$y > \frac{1}{4}x$

ANS: D REF: Algebra 1 Sec. 5.7
KEY: system of linear inequalities | graph of a system of linear inequalities | writing systems of linear inequalities NOT: Examples 4 and 5

18. Use the numbers to fill in m and b in the equation $y = mx + b$ to represent the line in the graph.



−3	−2	0	2	3

ANS:
$y = -2x + 3$

REF: Ch 4-5 Cumulative Test NOT: Exercise 2

19. You burn 20 calories per minute biking for x minutes and 10 calories per minute walking for y minutes. You spend a total of 90 minutes biking and walking and burn 1300 calories.

a. Write a system of equations to determine how much time you spend on each exercise.

b. How many minutes did you spend biking?

ANS:
a. $x + y = 90,\ 20x + 10y = 1300$

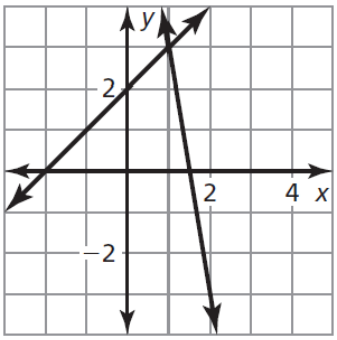
b. 40 min

REF: Ch 4-5 Cumulative Test NOT: Exercise 23

Use the graph to solve the system of linear equations. Check your solution.

20. $y = x + 2$

$y = -6x + 9$



ANS:
$(1, 3)$

REF: Ch 5 Quiz NOT: Exercise 1

Solve the system of linear equations using any method.

21. $3x - 2y = 2$

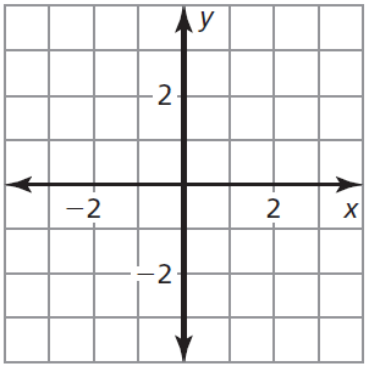
$5x - 5y = 10$

ANS:
$(-2, -4)$

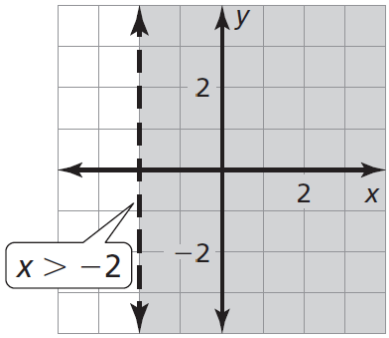
REF: Ch 5 Test A NOT: Exercise 5

Graph the inequality in a coordinate plane.

22. $x > -2$

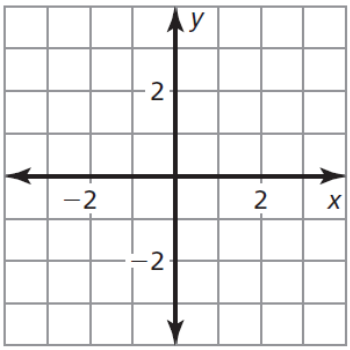


ANS:

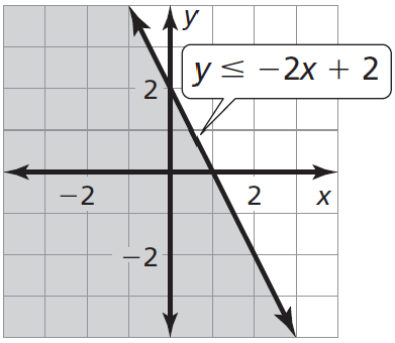


REF: Ch 5 Test A NOT: Exercise 7

23. $y \leq -2x + 2$



ANS:

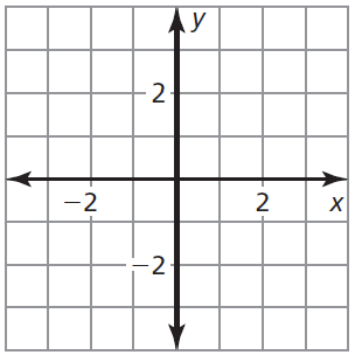


REF: Ch 5 Test A NOT: Exercise 8

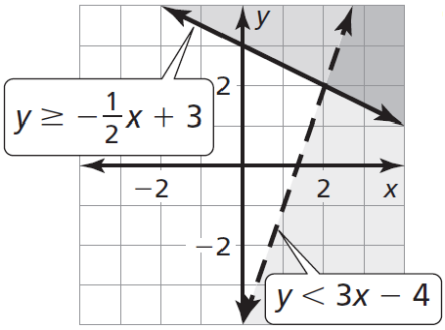
Graph the system of linear inequalities.

24. $y < 3x - 4$

$y \geq -\frac{1}{2}x + 3$



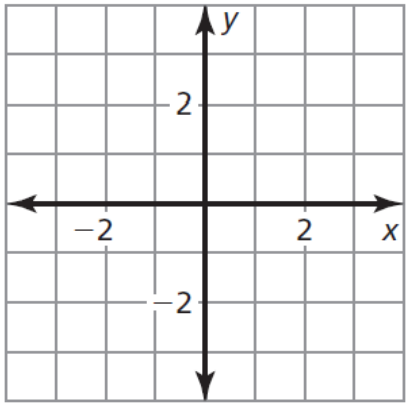
ANS:



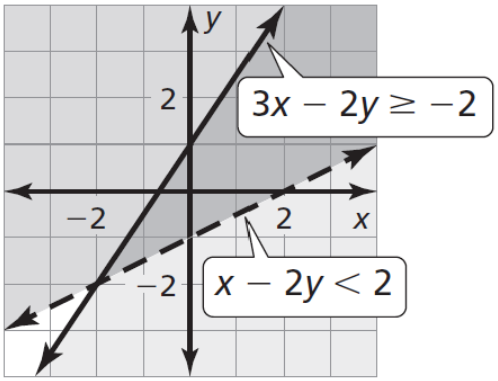
REF: Ch 5 Test A NOT: Exercise 9

25. $3x - 2y \geq -2$

$x - 2y < 2$



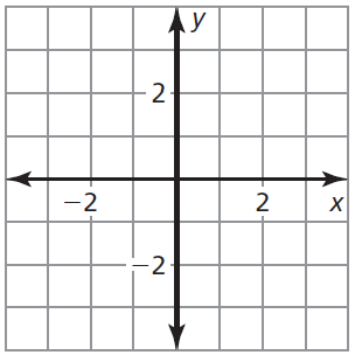
ANS:



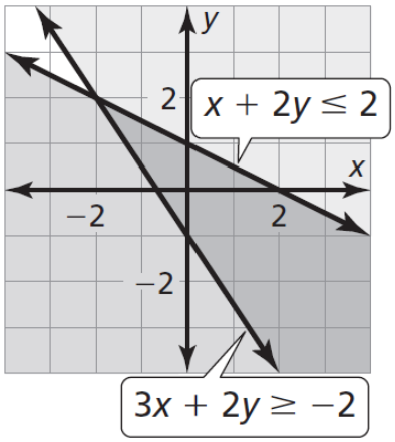
REF: Ch 5 Test A NOT: Exercise 10

26. $3x + 2y \geq -2$

$x + 2y \leq 2$



ANS:



REF: Ch 5 Test B NOT: Exercise 9

27. Two students are going to the store to buy school supplies for the new school year. One of the students buys 2 packs of pencils and 3 packs of pens for $8.25. Her friend purchases 5 packs of pencils and 2 packs of pens for $11.00. Is there enough information to determine the cost of 1 pack of pencils and 1 pack of pens? If so, find the cost of each.

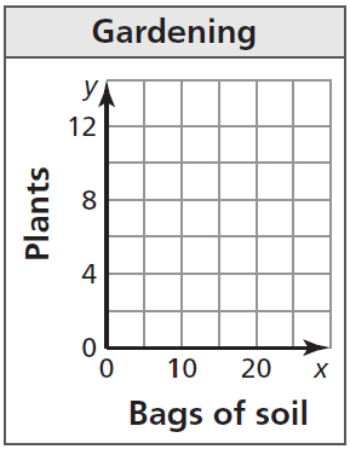
ANS:
yes; pencils: $1.50, pens: $1.75

REF: Ch 5 Test A NOT: Exercise 11

28. You are buying plants and soil for your garden. The soil costs $4.00 per bag and the plants cost $10.00 each. You want to buy at least 5 plants and can spend no more than $100 total.

a. Write a system of linear inequalities to model the situation.

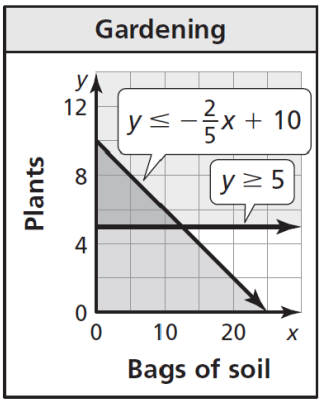
b. Graph the system of linear inequalities.



c. Identify and interpret a solution to the system.

ANS:
a. $y \geq 5,\ 4x + 10y \leq 100$

b.



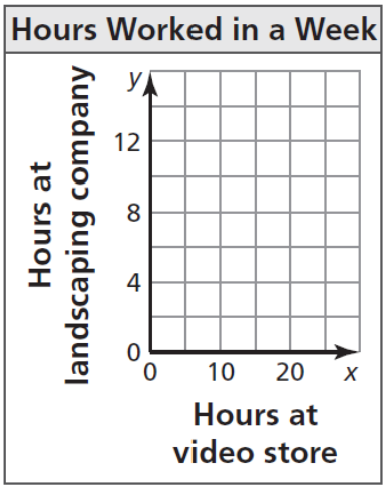
c. *Sample answer:* (10, 6); You can buy 10 bags of soil and 6 plants.

REF: Ch 5 Test A NOT: Exercise 15

29. You make $5 an hour in tips working at a video store and $7 an hour in tips working at a landscaping company. You must work at least 4 hours per week at the video store, and the total number of hours you work at both jobs in a week cannot be greater than 15.

a. Write a system of linear inequalities to model the number of hours that you could work at each location in a week.

b. Graph the system of linear inequalities.

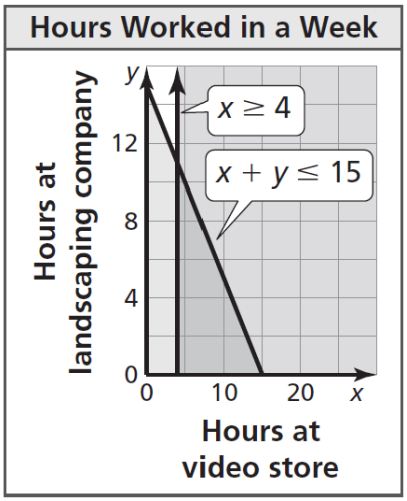


c. Write an equation that models the total tips you receive from the two jobs.

d. Identify and interpret a solution of the system.

ANS:
a. $x \geq 4, x + y \leq 15$

b.



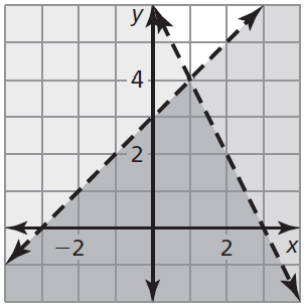
c. $P(x, y) = 5x + 7y$

d. (4, 9); You could work 4 hours at the video store and 9 hours at the landscaping company.

REF: Ch 5 Test B NOT: Exercise 16

Write a system of linear inequalities represented by the graph.

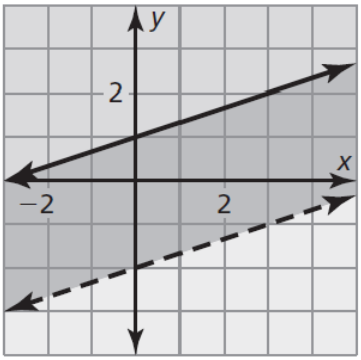
30.



ANS:
$y < x + 3, y < -2x + 6$

REF: Ch 5 Test B NOT: Exercise 17

31.



ANS:
$y \leq \frac{1}{3}x + 1, y > \frac{1}{3}x - 2$

REF: Ch 5 Test B NOT: Exercise 18