HOMEWORK

Homework Problems

Circle the homework problems assigned to you by the computer, then complete them below.

Explain
Solution By Graphing

Use Figure 5.1.1 to answer questions 1 through 3.

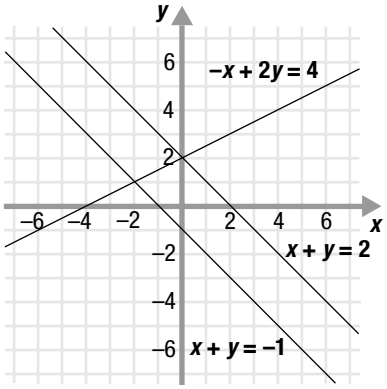


Figure 5.1.1

1. Which two lines form a system that has a solution of (–2, 1)?
2. Which two lines form a system that has no solution?
3. Which two lines form a system that has a solution of (0, 2)?
4. The ordered pair (–2, –5) is a solution of which system of equations?

$x - y = 7$
$3x + 2y = -11$

$4x + y = 6$
$x - 2y = 8$

$2x - y = 1$
$x + y = -7$

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

Use Figure 5.1.2 to answer questions 5 through 8.

5. Which two lines form a system that has a solution of (1, 6)?
6. Which two lines form a system that has a solution of (–4, 1)?
7. Which two lines form a system that has no solution?
8. What is the solution of the system of equations $x + 2y = -2$ and $3x + y = 9$?

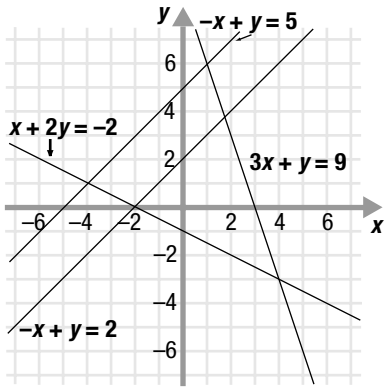


Figure 5.1.2

9. Raymond weighs 180 pounds and wants to lose some weight before his high school reunion. He figures he can lose 2 pounds a week if he sticks to a strict diet. If his reunion is in 14 weeks and he really sticks to his diet, will he be able to get down to his goal weight of 150 pounds? If so, how long will it take him? If not, how much longer will he have to stay on his diet? Graph the system to help you answer the questions.

$y = 180 - 2x$
$y = 150$

10. Katelyn has $50 in her bank account and saves $10 per week. Caesar has $200 in his bank account and withdraws $20 per week. When will Katelyn and Caesar have the same amount of money and how much will each have? Graph the system to help you answer the question.

$y = 50 + 10x$
$y = 200 - 20x$

Use Figure 5.1.3 to answer questions 11 and 12.

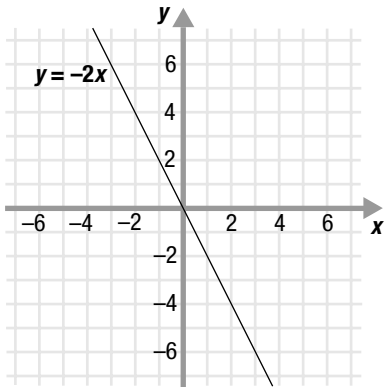


Figure 5.1.3

11. Draw a line on the grid in Figure 5.1.3 so that the system of equations has no solution.

12. Draw a line on the grid in Figure 5.1.3 so that the system of equations has one solution at the point (2, –4).

Solution by Algebra

13. Use the substitution method to solve this system:

$$x + 2y = 4$$
$$2x + 3y = 7$$

14. Use the elimination method to solve this system:

$$x + y = 7$$
$$x - y = 1$$

15. Use the elimination method to solve this system:

$$4x - y = -8$$
$$3x + 2y = 5$$

16. Use the substitution method to solve this system:

$$4x + y = 14$$
$$3x + 5y = -15$$

17. Use the substitution method to solve this system:

$$2x + y = 5$$
$$6x + 3y = 15$$

18. Use the elimination method to solve this system:

$$x + 7y = 31$$
$$x - 9y = -1$$

19. Use the elimination method to solve this system:

$$3x + y = 5$$
$$6x + 2y = 9$$

20. Use the substitution method to solve this system:

$$3x + y = 6$$
$$6x + 2y = 10$$

21. When renting a compact car, you have a choice of paying a flat rate of $25 per day with unlimited mileage or you can pay $15 per day and 20¢ per mile. How many miles can you drive before the cost of paying for mileage is the same as getting unlimited mileage? Use the substitution method or the elimination method to solve the system below to get the answer.

$$y = 25$$
$$y = 15 + 0.20x$$

22. The monthly rate for phone service can be paid for in one of two ways. One choice is to pay a measured rate of $4.45 per month and $.03 a minute for each local call. The other choice is to pay a flat rate of $8.35 per month. How many minutes of local calls can you make before the cost for measured rate service is the same as the cost for flat rate service? Use the substitution method or the elimination method to solve the system below to get the answer.

$$y = 4.45 + 0.03x$$
$$y = 8.35$$

23. Solve this system:

$$x - 4y = -31$$
$$3x + 2y = 5$$

24. Solve this system:

$$12x - 3y = 132$$
$$6x + 5y = 14$$

Explore

25. A system of two linear equations has the solution (2, 4). The slope of one of the lines is twice the slope of the other line. If the equation of one of the lines is $y = 3x - 2$, what are the two possible equations of the other line?

26. Which of the following systems of equations have no solutions?

$$x - y = 7 \qquad x + y = 3$$
$$3x - y = 9 \qquad 2y = -2x + 9$$

$$2x - 3y = 5 \qquad x + y = 3$$
$$x = 2y + 1 \qquad 2x - 5y = 6$$

27. Find the vertices of the triangle formed by the lines whose equations are shown below.

$y = x + 4$ $y = -2x + 4$ $\frac{1}{2}x + y = -5$

28. A system of two linear equations has the solution (0, –2). The slope of one of the lines is three times the slope of the other line. If the equation of one of the lines is $y = 3x - 2$, what are the two possible equations of the other line?

29. Which of the following systems of equations have exactly one solution in Quadrant II?

$y = x + 3$ $3x + 2y = 6$
$x + y = -1$ $x + 4y = -2$

$y = x + 2$ $x + y = -6$
$y = -\frac{1}{2}x - 4$ $3x + y = -12$

30. Find the vertices of the triangle formed by the lines whose equations are shown below.

$y = -2x + 3$ $2y - 5x = 10$ $5y = 2x - 15$

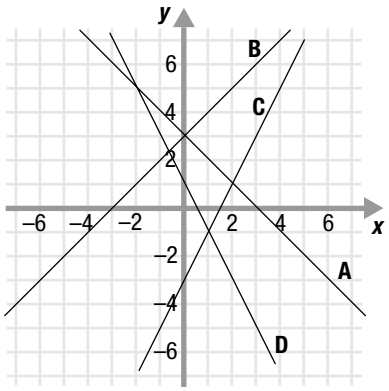
APPLY

Practice Problems

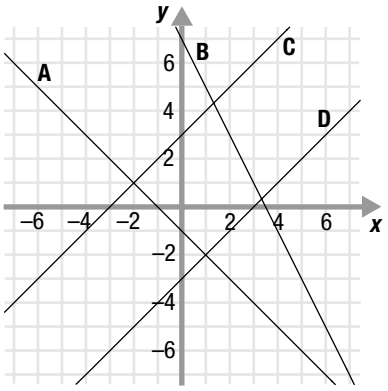
Here are some additional practice problems for you to try.

Solution by Graphing

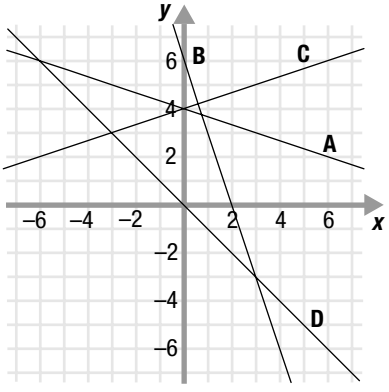
1. Which two lines form a system whose solution is (2, 1)?



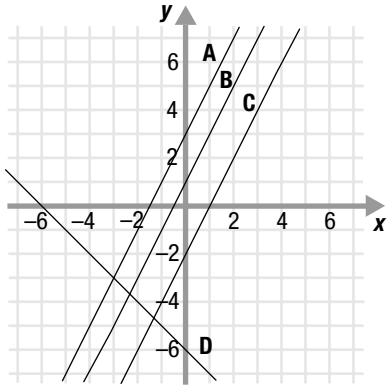
2. Which two lines form a system whose solution is (1, –2)?



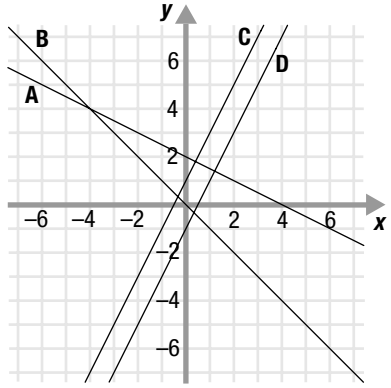
3. Which two lines form a system whose solution is (–3, 3)?



4. Which two lines form a system that has no solution?



5. Which two lines form a system that has no solution?



6. Graph each equation to find the solution of this system:

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

7. Graph each equation to find the solution of this system:

$$2x + y = 4$$
$$3x - 4y = 6$$

8. Graph each equation to find the solution of this system:

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

9. Graph each equation to find the solution of this system:

$$x + 3y = -6$$
$$x - 3y = 0$$

10. Graph each equation to find the solution of this system:

$$x - y = -4$$
$$x + 2y = -1$$

11. Graph each equation to find the solution of this system:

$$3x - 2y = -6$$
$$-6x + 4y = 9$$

12. Graph each equation to find the solution of this system:

$$4x - y = 8$$
$$-8x + 2y = -16$$

13. Graph each equation to find the solution of this system:

$$2x - y = 4$$
$$-4x + 2y = 6$$

14. Graph each equation to find the solution of this system:

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

15. Graph each equation to find the solution of this system:

$$2x + y = -6$$
$$3x - y = 1$$

16. Graph each equation to find the solution of this system:

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

17. Graph each equation to find the solution of this system:

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

18. Graph each equation to find the solution of this system:

$$-2x + 3y = -6$$
$$6x - 9y = -18$$

19. Graph each equation to find the solution of this system:

$$x - 3y = 6$$
$$-2x + 6y = -12$$

20. Graph each equation to find the solution of this system:

$$x + y = 4$$
$$2x - y = 5$$

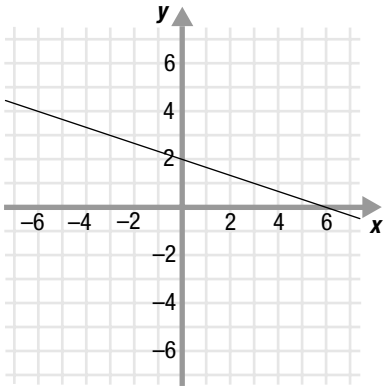
21. Graph each equation to find the solution of this system:

$$x + y = 4$$
$$5x - 2y = -1$$

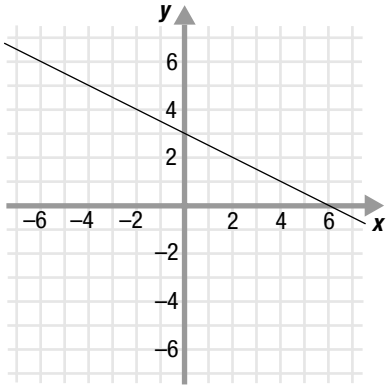
22. Graph each equation to find the solution of this system:

$$2x + 2y = 8$$
$$x - 3y = 8$$

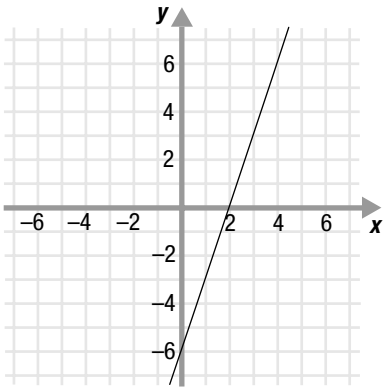
23. Draw a line on the grid below so that the system of equations has no solution.



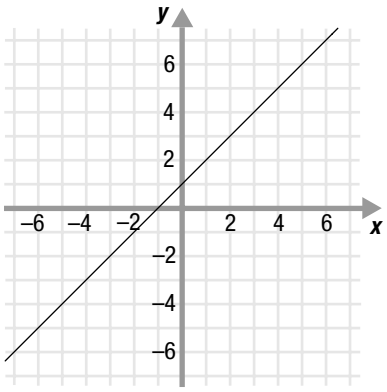
24. Draw a line on the grid below so that the system of equations has an infinite number of solutions.



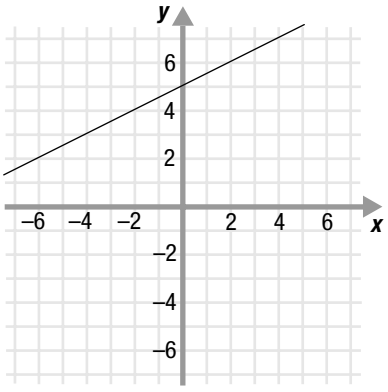
25. Draw a line on the grid below so that the system of equations has no solution.



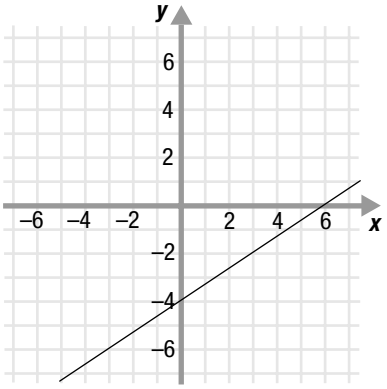
26. Draw a line on the grid below so that the system of equations has one solution at the point (1, 2).



27. Draw a line on the grid below so that the system of equations has one solution at the point (–4, 3).



28. Draw a line on the grid below so that the system of equations has one solution at the point (3, –2).



Solution by Algebra

29. Use the substitution method to solve this system:

$$x - 2y = -1$$
$$x + y = 5$$

30. Use the substitution method to solve this system:

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

31. Use the substitution method to solve this system:

$$2x + y = -1$$
$$x - y = 7$$

32. Use the substitution method to solve this system:

$$4x - 3y = -7$$
$$x + 2y = 12$$

33. Use the substitution method to solve this system:

$$3x + 5y = 1$$
$$4x - y = 9$$

34. Use the substitution method to solve this system:

$$3x - 7y = 4$$
$$2x + y = -3$$

35. Use the substitution method to solve this system:

$$4x + y = 7$$
$$x + 2y = 2$$

36. Use the substitution method to solve this system:

$$4x - 2y = 7$$
$$4x + y = -2$$

37. Use the substitution method to solve this system:

$$\begin{aligned} 5x + y &= 1 \\ x - 3y &= 2 \end{aligned}$$

38. Use the substitution method to solve this system:

$$\begin{aligned} -3x + 2y &= 8 \\ x + 2y &= -6 \end{aligned}$$

39. Use the substitution method to solve this system:

$$\begin{aligned} 4x - 3y &= -2 \\ -3x + y &= 6 \end{aligned}$$

40. Use the substitution method to solve this system:

$$\begin{aligned} 2x - 3y &= 1 \\ -4x + y &= 7 \end{aligned}$$

41. Use the substitution method to solve this system:

$$\begin{aligned} 3x - y &= 5 \\ -6x + 2y &= -10 \end{aligned}$$

42. Use the substitution method to solve this system:

$$\begin{aligned} x + 5y &= 5 \\ 3x + 15y &= 11 \end{aligned}$$

43. Use the elimination method to solve this system:

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

44. Use the elimination method to solve this system:

$$\begin{aligned} x + y &= 3 \\ -x + y &= 7 \end{aligned}$$

45. Use the elimination method to solve this system:

$$\begin{aligned} x + y &= 10 \\ x - y &= 2 \end{aligned}$$

46. Use the elimination method to solve this system:

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

47. Use the elimination method to solve this system:

$$\begin{aligned} 3x - y &= 7 \\ x + y &= 5 \end{aligned}$$

48. Use the elimination method to solve this system:

$$\begin{aligned} x + 2y &= 8 \\ x - y &= -1 \end{aligned}$$

49. Use the elimination method to solve this system:

$$\begin{aligned} 3x - 2y &= 4 \\ -6x + 3y &= -15 \end{aligned}$$

50. Use the elimination method to solve this system:

$$\begin{aligned} 4x - 5y &= 12 \\ 6x + 10y &= 18 \end{aligned}$$

51. Use the elimination method to solve this system:

$$\begin{aligned} 5x - 8y &= 10 \\ 3x + 4y &= 6 \end{aligned}$$

52. Use the elimination method to solve this system:

$$\begin{aligned} 2x - 2y &= -1 \\ 3x + 3y &= 2 \end{aligned}$$

53. Use the elimination method to solve this system:

$$\begin{aligned} -3x + 2y &= 3 \\ 4x + 3y &= -2 \end{aligned}$$

54. Use the elimination method to solve this system:

$$\begin{aligned} 2x + 2y &= -1 \\ 5x - 5y &= 1 \end{aligned}$$

55. Use the elimination method to solve this system:

$$\begin{aligned} 3x - 2y &= 5 \\ -9x + 6y &= 12 \end{aligned}$$

56. Use the elimination method to solve this system:

$$\begin{aligned} 2x - 7y &= 0 \\ 6x - 21y &= 0 \end{aligned}$$

EVALUATE

Practice Test

Take this practice test to be sure that you are prepared for the final quiz in Evaluate.

1. The graph of the linear system below is shown in Figure 5.1.14. Find the solution of the system.

$$-x + y = -2$$
$$3x - 2y = 8$$

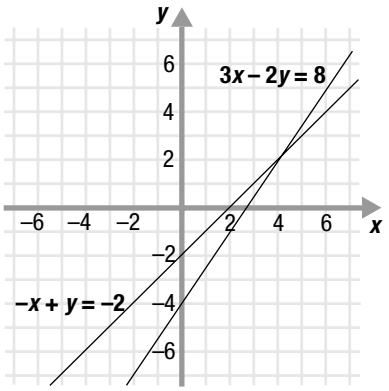


Figure 5.1.4

2. The graph of the linear system below is shown in Figure 5.1.5. Find the solution of the system.

$$y = 2x + 13$$
$$x + 2y = 6$$

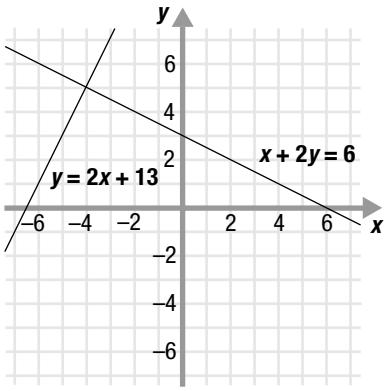


Figure 5.1.5

3. The graph of the linear system below is shown in Figure 5.1.6.

$$x + 2y = -12$$
$$-3x + y = 1$$

Circle the statements that are true.

The system has a solution at the point (–2, –5).

The system has only one solution but it is not shown on the graph.

The system has no solution.

The system has an infinite number of solutions.

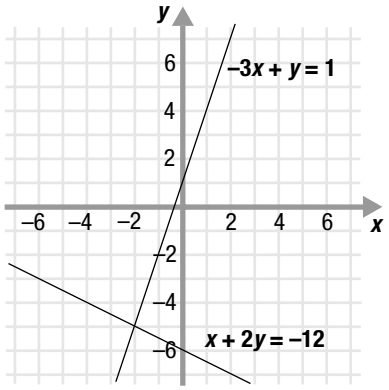


Figure 5.1.6

4. The graph of the linear system below is shown in Figure 5.1.7. Find the solution of the system.

$$2x - 5y = 10$$
$$4x + 5y = 20$$

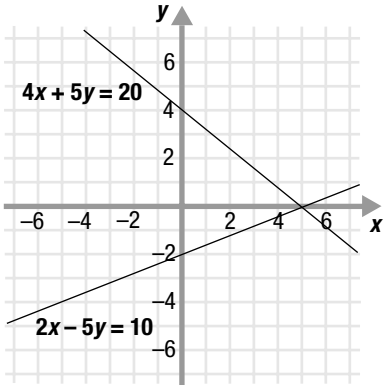


Figure 5.1.7

5. One of the equations in a linear system is $2x + 3y = 6$. Its graph is shown in Figure 5.1.8. If the solution of the system is (–6, 6), which of the following could be the other equation in the system?

$5x - y = 7$
$3x + 4y = 6$
$x + 3y = -11$
$2x - 4y = 1$

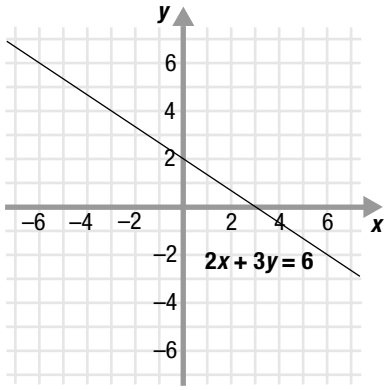


Figure 5.1.8

6. The graph of the linear system below is shown in Figure 5.1.9.

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

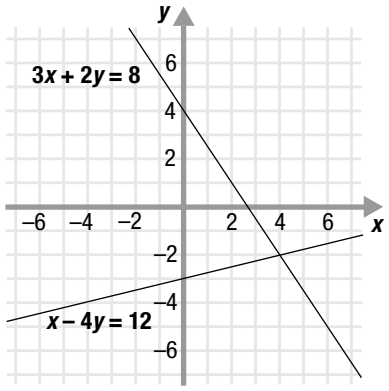


Figure 5.1.9

Which other line passes through the solution of the system?

$4x - y = 12$
$-2x + y = -5$
$3x - 3y = 7$
$x + y = 2$

7. Find the solution of this system:

$x = -1$
$y = 4$

8. The solution of the following linear system is (–2, –3).

$5x - 3y = -1$
$2x + 7y = -25$

If the first equation is multiplied by 7 and the second equation is multiplied by 3, the result is this system:

$35x - 21y = -7$
$6x + 21y = -75$

Which of the following statements are true?

The system has an infinite number of solutions.
The system has no solution.
The system has only one solution, the point (–2, –3).
The system has only one solution, the point (–14, –9).

9. Use substitution to solve this linear system:

$3x - 5y = 11$
$2x + y = 29$

10. Use substitution to solve this linear system:

$x - 3y = -3$
$2x + y = 22$

11. Use the elimination method to solve this linear system:

$2x + y = 4$
$5x - 2y = 1$

12. Solve this linear system:

$7x - 6y = 27$
$4x - 5y = 17$