For 1-13 solve each system of equations by graphing. Write *No Solution* and *Many Solutions* where *appropriate.*

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

2. $y = \frac{1}{2}x$
   $y = -\frac{3}{2}x + 8$

3. $y = 2x + 2$
   $y = -\frac{1}{2}x - 8$

4. $y = -\frac{1}{3}x$
   $4x - 12y = -24$

5. $y = -3x + 4$
   $12x + 4y = 24$

6. $.y = -3x + 7$
   $10x + 10y = 50$

7. $y = -x - 2$
   $4x - 2y = 16$

8. $y = -6$
   $-18x + 9y = -18$

9. $x = 4$
   $24x - 48y = 144$

10. $y = 2x - 8$
    $10x - 5y = 40$

11. $10x + 20y = 80$
    $5x - 10y = 20$

12. $4x + 4y = -28$
    $12x - 6y = -48$

13. $-8x + 4y = 16$
    $6x + 6y = 6$

For 14 to 20, without graphing tell if each system of equations has, NO SOLUTION, ONE SOLUTION, or MANY SOLUTIONS.

14. $y = 5x - 9$
    $y = -9x + 1$

15. $y = 2x + 3$
    $y = -\frac{1}{2}x + 7$

16. $y = 6x - 1$
    $y = 6x + 11$

17. $y = 4x + 10$
    $y = x + 10$

18. $y = 3x - 8$
    $24x - 8y = 64$

19. $y = 2x + 3$
    $2x - 4y = 12$

20. $y = -6x + 3$
    $12x + 2y = 4$

For 21-30, solve each system of equations by substitution.

21. $y = 6x - 13$
    $y = -2x + 19$

22. $y = -x - 5$
    $y = 3x + 27$

23. $y = \frac{1}{2}x - 3$
    $y = -7x + 42$

24. $y = -x + 12$
    $y = -3x + 36$

25. $y = 2x - 7$
    $4x + y = 29$

26. $y = 4x - 5$
    $2x + 7y = -65$

27 $y = -3x + 71$
    $6x + 3y = 168$

28. $y = -x + 5$
    $5x + 2y = -11$

29. $x + y = 12$
    $3x + 4y = 41$

30. $x + y = 8$
    $8x + 12y = 93$

For 31 to 38, solve each system of equations by using elimination.

31. $4x + 3y = 25$
    $6x - 3y = 15$

32. $5x - 6y = 42$
    $-5x - 7y = -16$

33. $8x + 7y = -29$
    $8x + 2y = -54$

34. $3x + 4y = -65$
    $11x + 4y = -121$

35. $9x - 5y = -26$
    $2x - 5y = -33$

36. $x + 8y = 36$
    $-4x + 3y = -4$

37. $10x - 5y = 20$
    $7x + y = 50$

38. $6x + 12y = 30$
    $4x - 2y = 10$

39. This past weekend you and some of you neighbors went to an amusement park. Four adults and six children cost $294. The following weekend you went again with some of your relatives. Three adults and five children cost $233. Write and solve a system of equations to find the price of an adult admission and the price of a child's admission.

40. Suppose you invest $2500 for equipment to print designs on T-shirts that you will then sell. Each blank T-shirt will cost you $3. It will cost you $2.50 in ink and time to print each t-shirt. After you've printed the design on the shirt you will sell them for $20 each. How many shirts must you sell in order to break even?

41. For Halloween you went to the store and bought some bags of Snickers and Kit-Kat candy bars. A bag of Snickers has 24 pieces of candy and a bag of Kit-Kats has 20 pieces of candy. You have a total of 24 bags and a total of 508 pieces of candy. Write and solve a system of equations to find the number of bags of each kind of candy.

42. A cup of coffee which is at $170°F$ is placed on the table and cools down at a rate of $12°$ per minute. At the same time an ice cube which is at $32°F$ is placed on the table and warms up at a rate of $5°$ per minute. Write and solve a system of equations to find the number of minutes it will take for the coffee and the ice cube to reach the same temperature. Round to the nearest hundredth.

43. In the morning you take off on a roundtrip and fly for 8 hours into a headwind (against the wind) and travel 960 miles. After lunch you fly back with a tailwind (with the wind) 960 miles in 6 hours. Write and solve a system of equations to find the speed of the plane and the speed of the wind.

Graph each inequality.
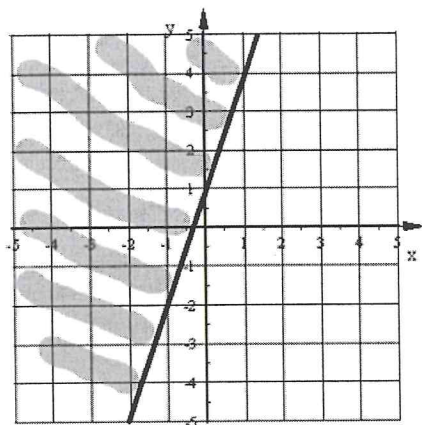
44. $y \geq -2x + 2$ 45. $y < \frac{3}{2}x$ 46. $x > -3$ 47 $y \leq 1$

48. $10x + 15y \geq 30$ 49. $9x - 6y < 18$

50. Write the inequality that models the graph.

Graph each system of inequalities. Shade the solution region with either a colored pencil or a highlighter.

51.   52.

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

$4x + 8y > -24$ $10x - 4y \leq 20$

2

1. $(1,-1)$ 2. $(4,2)$ 3. $(-4,-6)$ 4. $(-3,1)$ 5. No Solution   6. $(1,4)$ 7. $(2,-4)$

8. $(-2,-6)$ 9. $(4,-1)$ 10. Many Solutions   11. $(6,1)$ 12. $(-5,-2)$ 13. $(-1,2)$

14. One Sol   15. One Sol   16. No Sol   17. One Sol   18. Many Sol

19. One Sol   20. No Sol   21. $(4,11)$ 22. $(-8,3)$ 23. $(6,0)$ 24. $(12,0)$

25. $(6,5)$ 26. $(-1,-9)$ 27. $(15,26)$ 28. $(-7,12)$ 29. $(7,5)$ 30. $(0.75,7.25)$

31. $(4,3)$ 32. $(6,-2)$ 33. $(-8,5)$ 34. $(-7,-11)$ 35. $(1,7)$ 36. $(4,4)$ 37. $(6,8)$ 38. $(3,1)$

39. $4A+6C=294$ $A =$Adult admission is \$36 $C =$Children's admission is \$25

        $3A+5C=233$

40. $Expenses = 2500+3T+2.50T$ $Income = 20T$

Break-even EQ: Expenses = Income $2500+3T+2.50T = 20T$

Break-even point=173 t-shirts

41. $S = $ # bags of Snickers $K = $ # bags of Kit-Kats

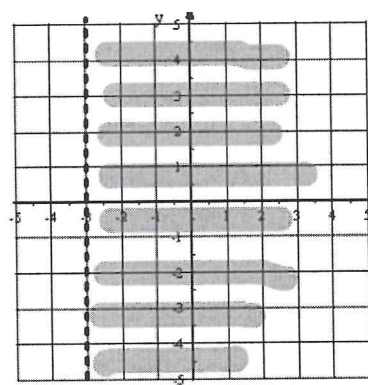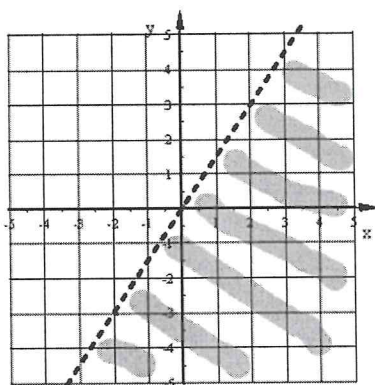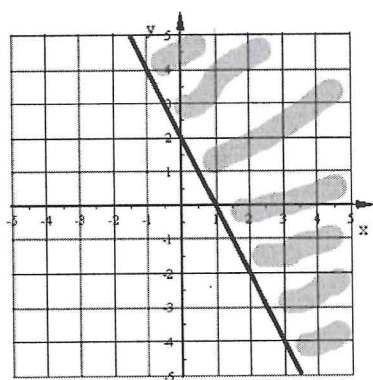 $S+K=24$ $24S+20K=508$ 7 bags of Snickers and 17 bags if Kit-Kats.

42. $T = 170-12m$ $T = 32+5m$ $m = 8.12$ minutes

43. $(p-w)8 = 960$ $p = $speed of the plane=140 mph $w = $speed of the wind=20 mph
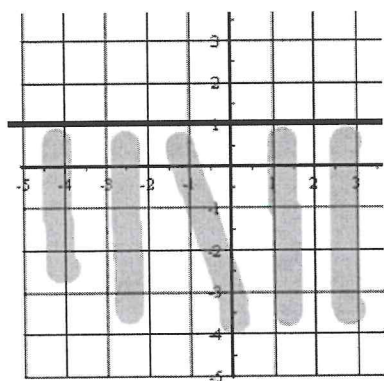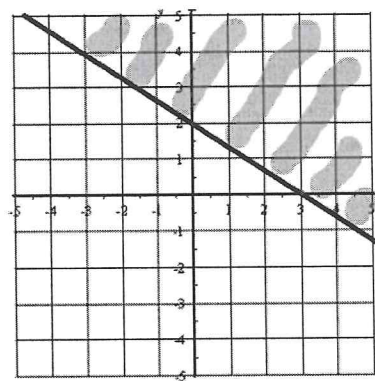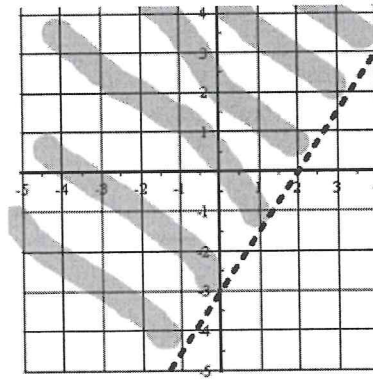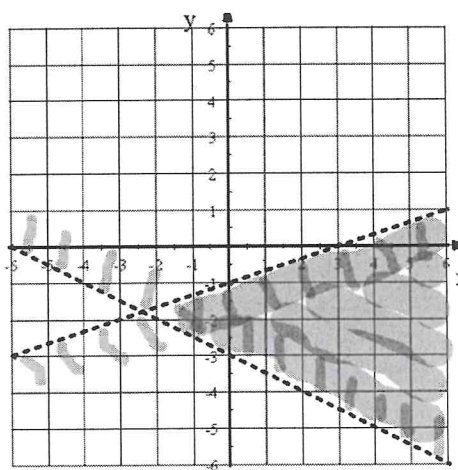
        $(p+w)6 = 960$

44.

45.

46.

47.

48.

49.

50. $y \geq 3x + 1$

51.

52.