

1. The greater the value of the coefficient of x , the steeper the line.
2. A relation is a function if for every x -value (domain value, independent variable value), there is no more than one y -value (range value, dependent variable value).
3.
 - a. The graph represents a function. Each x -value has no more than one corresponding y -value.
 - b. $f(-1) = 2$
 - c. $f(5) = -4$
 - d. $f(0) = 1$
4.
 - a. $f(4) = 14$
 - b. $f(-2) = -4$
5.
 - $D = 100 - 2.5t$ or $D = -2.5t + 100$ (Response should indicate how the numbers -2.5 and 100 were determined.)
 - The runner is traveling at 2.5 yards per second. (Response should indicate a ratio of changes in D and t in some form.)
 - 20 yards from the finish. (Possible responses could be evaluating the function at $t = 32$, or continuing the pattern in the table $24 \rightarrow 40$, $28 \rightarrow 30$, $32 \rightarrow 20$.)

6.

x	y
-3	7
-2	4
-1	1
0	-2
1	-5
2	-8
3	-11

x	y
0	-4
1	1
2	6
3	11
4	16
5	21
6	26

7. **C**
8. **B**
9.
 - a. The x -intercept is 10 . The student can extend the table, write the equation for the line $\left(y = -\frac{3}{2}x + 15\right)$ or graph the points.
 - b. The y -intercept is 15 . The student can extend the table, write the equation for the line $\left(y = -\frac{3}{2}x + 15\right)$ or graph the points.

10. **D**

11. C

12.

- 7.0 gallons (Response could indicate a rate of change of 0.4 gals per second times 5 seconds for a total change of 2 gallons, $5 \times 0.4 = 2$. Response could indicate an equation $G = 3.0 + 0.4t$ and evaluating the function at $t = 10$. Response could indicate a continuation of the table.)
- The relationship is linear. (Response should indicate that as time increases by one second, that the number of gallons increases by a constant 0.4 gallons.)

13. a. $x = -36$

b. $r = 12$

c. $x = 3$

d. $x = \frac{17}{12} \approx 1.416666$

e. $x = 6$

14. $2x + 3 = 5x - 6$

$3x = 9$

$x = 3$

$2(3) + 3 = 9$

or $5(3) - 6 = 9$

Opposites sides are 9 units

15. $32 + 7c < 47.75$

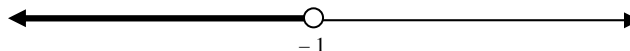
$c < 2.25$

16.

a. $x \leq 4$



b. $x < -1$



c. $x > -11$



17. • $C = 10.00 + 1.50n$

- \$14.50 (response should indicate substitution into the equation or state verbally “add 3 times \$1.50 plus \$10.00”)
- 14 nights (response could indicate solving the equation $31.00 = 10.00n + 1.50$, or could indicate dividing \$21.00 by \$1.50)

18. a. (i) $y = \frac{3}{4}x + 2$

(ii) $y = -\frac{1}{2}x + 5$

b. line (i)

19. a. $W = \frac{12-2L}{2}$ or $W = 6-L$ or $W = -L+6$

b. $H = \frac{A-C}{B}$

20. D

21. $\frac{3}{4}$ or 0.75

22. a. $y = 3x+6$ or $-3x+y=6$ or $3x-y=-6$ or $y = 6+3x$

b. $y = \frac{1}{2}x+4$ or $-x+2y=8$ or $x-2y=-8$ or $y-3 = \frac{1}{2}(x+2)$ or $y = 4 + \frac{1}{2}x$

c. $y = -2x+4$ or $2x+y=4$ or $y = 4-2x$

d. $y = \frac{2}{5}x-3$ or $y = -3 + \frac{2}{5}x$ or $-2x+5y=-15$ or $2x-5y=15$

23.

- $E = 0.15x$
- 166 coupons (Response could indicate solving the equation $24.90 = 0.15x$, or a division of \$24.90 by \$0.15)

24. •
$$\begin{cases} x+y=50 \\ 1.5x+2y=95 \end{cases}$$

- $x = 10, y = 40$ (Response should indicate the method used to solve the system)
- 10 boxes of M&M's, 40 boxes of Reese's.

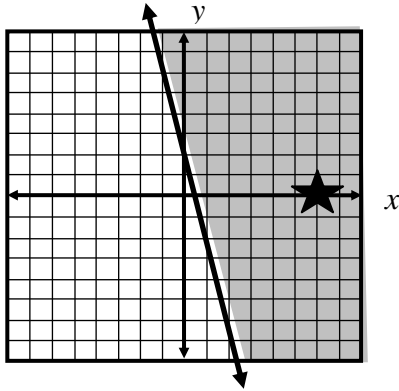
25. If the slopes are the same but the y-intercepts are different, the two lines are parallel.

If the slopes and y-intercepts are the same, the lines intersect at an infinite number of points.

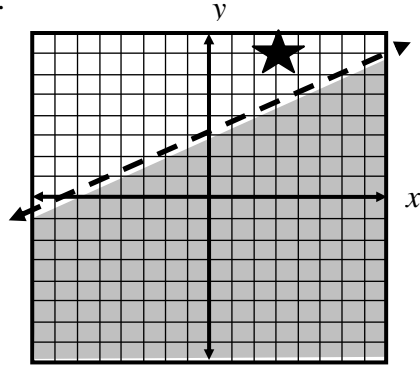
If the slopes of the graphs are different, the lines intersect at exactly one point.

26. One grid line equals one unit.

a.



b.



b. (6,0) is in the shaded region and is a solution to the inequality.

d. (3,7) is not in the shaded region and is not a solution to the inequality.

OR Show algebraically by substituting the points into the inequality and verifying the results:

$$4(6) + 0 \geq 2$$

$$24 \geq 2 \quad \text{True}$$

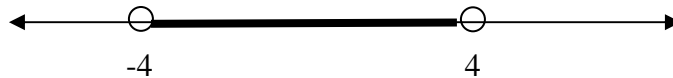
$$7 < \frac{1}{2}(3) + 3$$

$$7 < 4.5 \quad \text{False}$$

27. Roberto orders 11 rings.

28. $|x - 50| \leq 3$

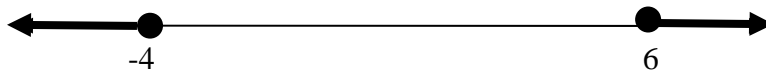
29. a. $-4 < x < 4$



b. $-11 < x < 5$



c. $x \geq 6$ or $x \leq -4$



30. • \$240 *Response could indicate using the rate of change of \$30 per year or continuing the pattern: 0 → 240.*

• 8 years *Response could indicate a continuation of the pattern: 6 → \$60, 7 → \$30, 8 → \$0*

31. • Jay’s uncle gives him an additional 15 cards each year.

• Jay’s father gave him 40 cards to start.

32. **B**

33. $\frac{39}{6}$ or $\frac{13}{2}$ or 6.5

34. **D**35. **A**

36. a. $S = 1.2w$ or $\frac{S}{w} = \frac{12}{10}$

b. 18 centimeters

37. a. $C = 2.67g$

b. $d = 65t$

c. $W = 7.5h$ or $W = 7.50h$

38. a. $y = \frac{8}{5}x$ When $x = 40$, $y = 64$. $\left(\frac{8}{5}\right.$ can be written as 1.6 or $\left.\frac{24}{16}\right)$

b. $C = 780A$ When $C = 500$, $A = .641$ or $\frac{25}{39}$ cups.

39. **A**40. **B**

41. a. The graphs are parallel lines and the system has no solutions.

b. The graphs intersect in one point and the system has exactly one solution.

c. The graphs are the same lines. The lines intersect in an infinite number of points and the system has an infinite number of solutions.

42. $\left(-\frac{4}{3}, 3\right)$

43. Let x represent the number of hours to fix the brakes

$$25 + 50x = 70 + 40x$$

$$x = 4.5 \text{ hours}$$

44. **B**45. **A**

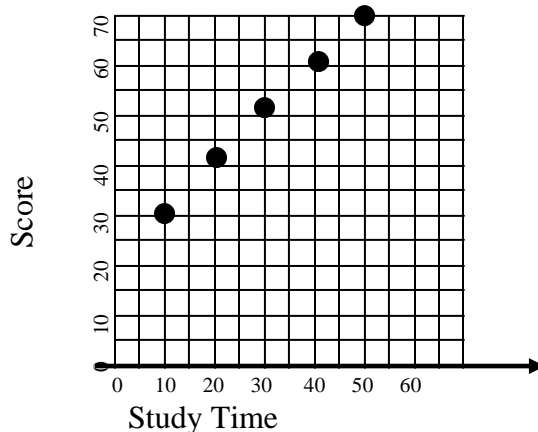
46.

- 15 gallons per minute
- The x -intercept represents the number of minutes required to drain the tub. The y -intercept represents how many gallons of water were in the tub when the tub started draining.
- $y = 120 - 15x$ or $y = -15x + 120$

47. $20 \leq x \leq 30$

48. • The calculator gives a line of fit as $y = 3.885714286x + 26.74285714$. *Accept slope values between 3 and 5 and intercepts between 5 and 30.*
- The y-intercept gives the number of seconds Jan could hold her breath swimming underwater before the swimming class started.
 - The rate of change is 3.886 seconds per week (*or student's slope number*)
 - Using the calculator equation results in 73.371 seconds in the 12th week of class. *Accept correct responses based on the equation given in the first part.*
 - Using the calculator equation results in 17.565 weeks. *Accept correct responses based on the equation given in the first answer. Accept 18 weeks.*

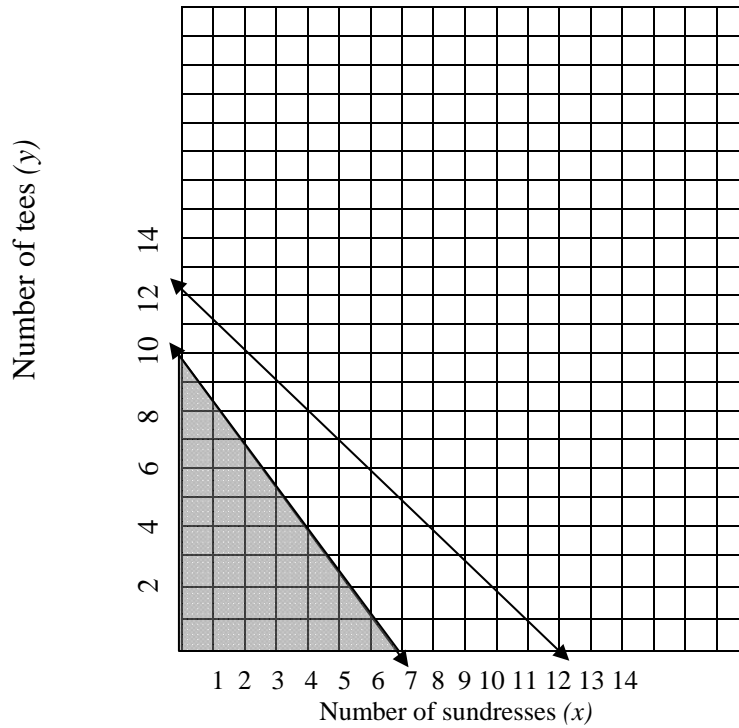
49. Study Time and Scores



- The calculator gives a line of fit of $y = .98x + 21.2$. *Accept slope values between 0.5 and 1.5 and y-intercept values between 15 and 25.*
- Using the calculator equation $y(7) = 28.06$. *Accept responses that are correct based on the students' equation in the previous part.*

50. a. $x + y < 12$
 $15x + 10y \leq 100$

b.



The shaded area represents the solution to the system of equations.

- c. Many possibilities including:
 6 sundresses and 1 tee
 3 sundresses and 5 tees
 1 sundress and 8 tees
 10 tees