Name: _____ **Class:** _____ **Date:** _____ **ID: A**

SREB UNIT 1 - 4 STUDY GUIDE

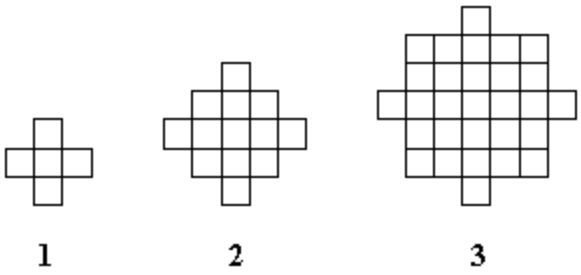
Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. The function $j(x) = 39x$ represents the number of jumping jacks $j(x)$ you can do in x minutes. How many jumping jacks can you do in 5 minutes?

a. 195 jumping jacks
b. 7 jumping jacks
c. 144 jumping jacks
d. 234 jumping jacks

Name: _____ **ID: A**

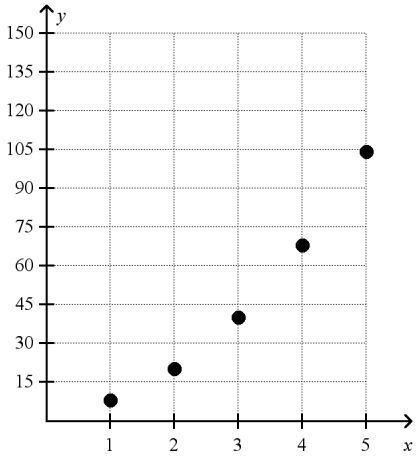
The table shows the total number of squares in each figure below. What is a pattern you can use to complete the table?



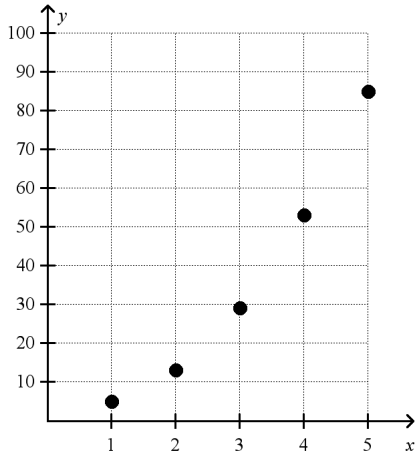
Number of Figure, x	Total Number of Squares, y	Ordered Pair (x, y)
1	5	(1, 5)
2	13	(2, 13)
3	29	(3, 29)
4		
5		

____ 2. Which of the following graphs matches the pattern described above?

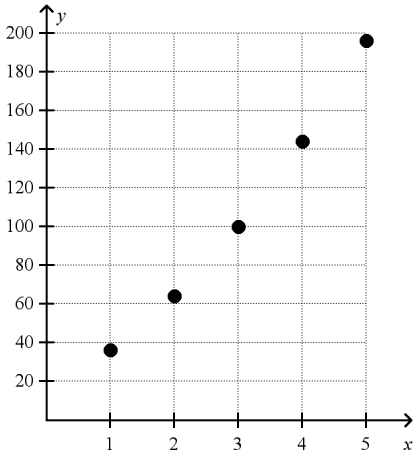
a.



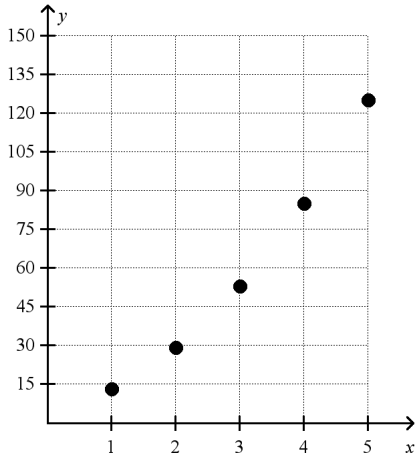
c.



b.



d.



____ 3. Which of the following equations represents the pattern above?

a. $y = (2x+4)^2$

b. $y = (2x+1)^2 + 4$

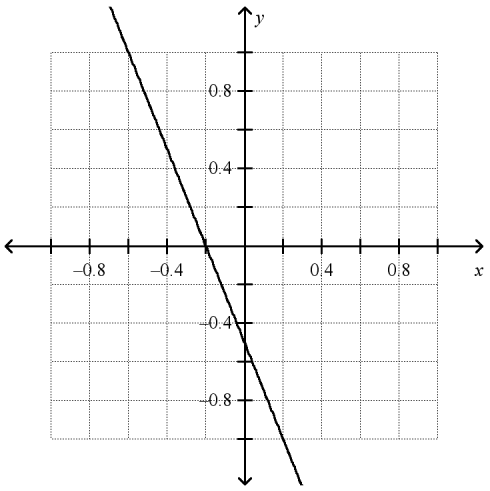
c. $y = (2x)^2 + 4$

d. $y = (2x-1)^2 + 4$

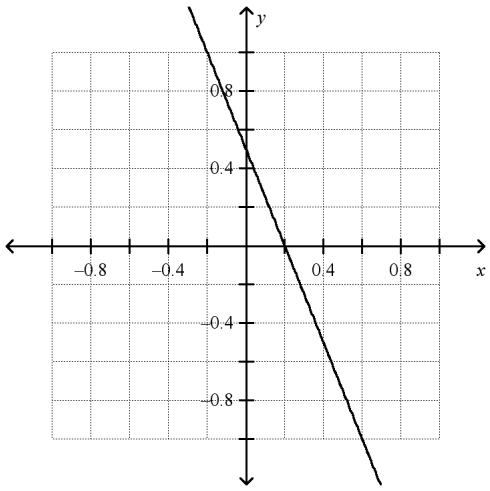
Match the equation with its graph.

____ 4. $0.5x + 0.2y = 0.1$

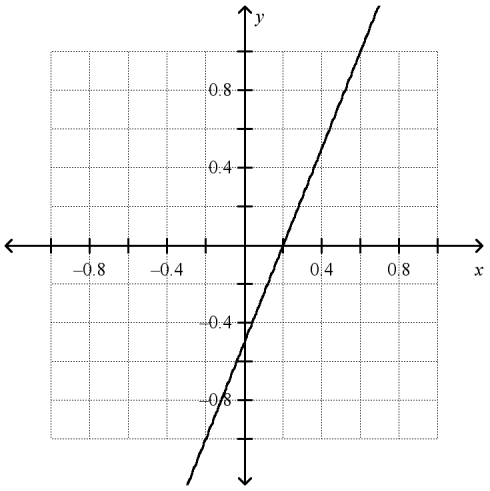
a.



c.



b.



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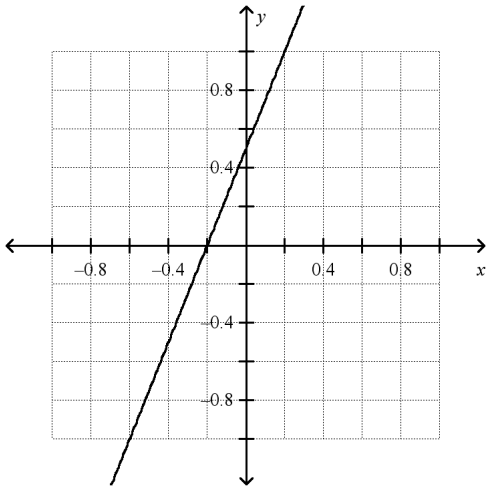
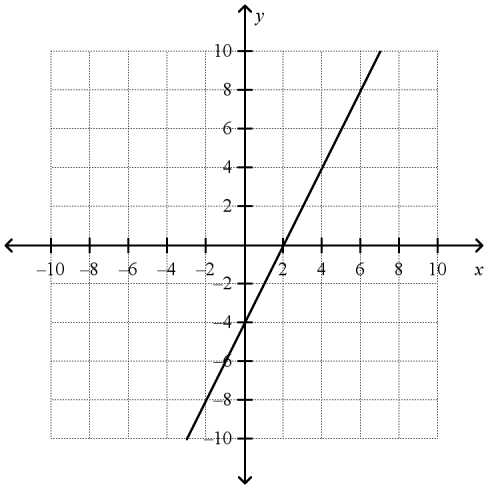
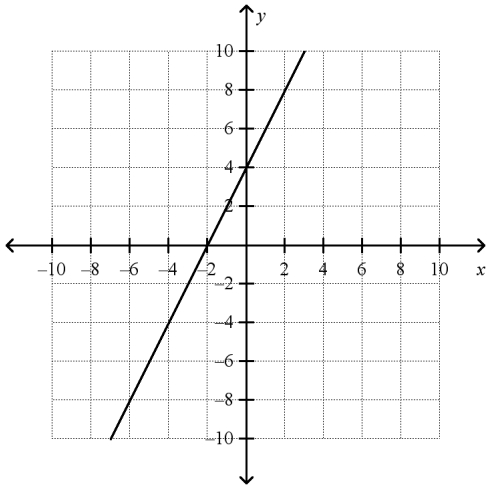


____ 5. $-4x - 2y = 8$

a.



c.



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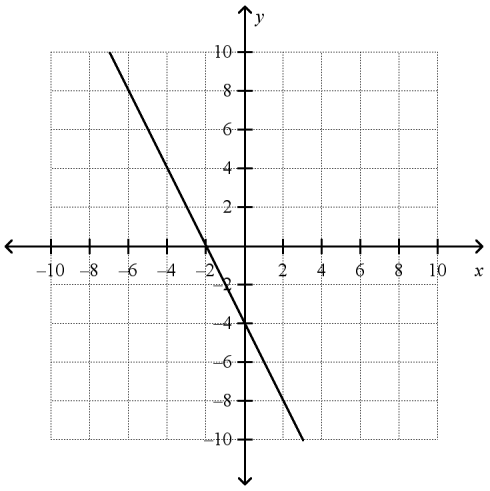
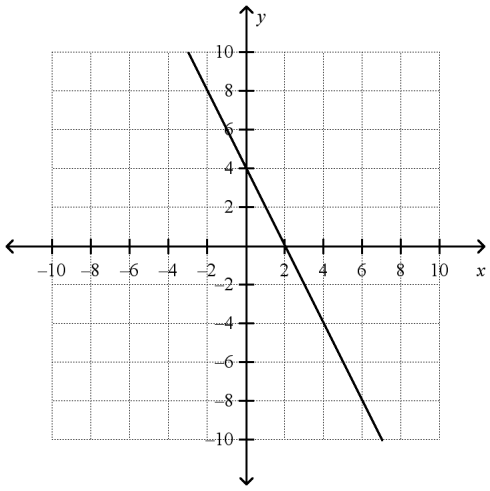


d.



____ 6. The function $b(n) = 6n$ represents the number of light bulbs $b(n)$ that are needed for n chandeliers. How many light bulbs are needed for 15 chandeliers?

a. 90 light bulbs
c. 96 light bulbs
b. 2 light bulbs
d. 80 light bulbs

____ 7.

x	*y*
1	12.3
2	19.6
3	26.9
4	34.2
5	41.5

Graph the function shown by the table. Is the function linear or nonlinear?

a. linear
b. nonlinear

The table shows the relationship between the number of sports teams a person belongs to and the amount of free time the person has per week.

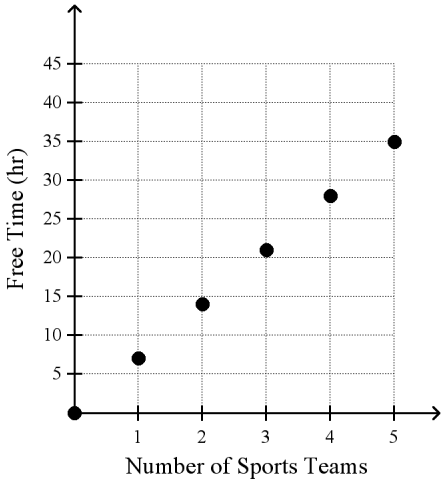
Number of Sports Teams	Free Time (hours)
0	46
1	39
2	32
3	25

____ 8. Is the above relationship a linear function?

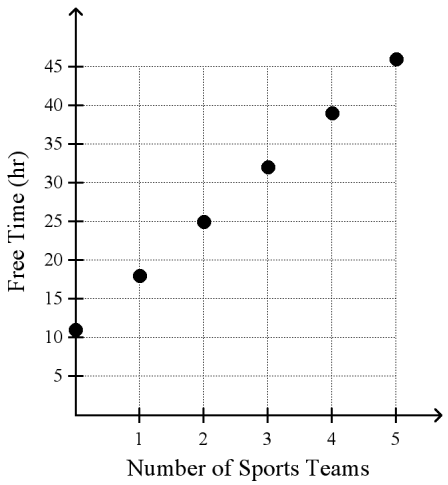
a. yes b. no

____ 9. What is the graph for the above relationship?

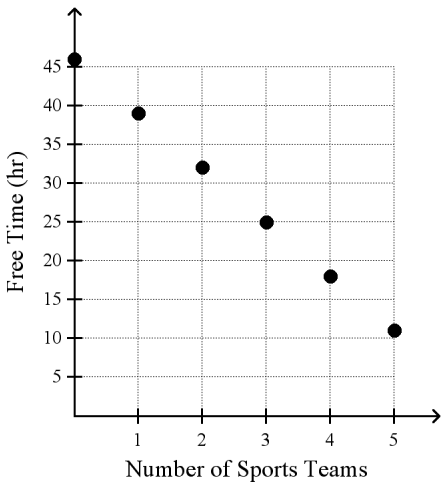
a.



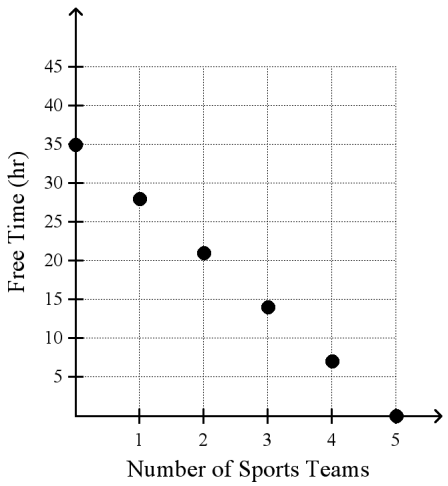
c.



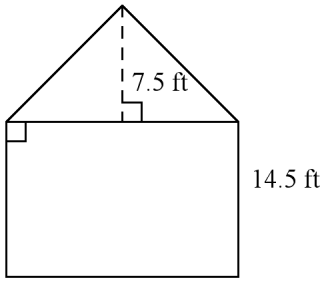
b.



d.



____ 10. When designing a building, you must be sure that the building can withstand hurricane-force winds, which have a velocity of 74 mi/h or more. The formula $F = 0.004Av^2$ gives the force F in pounds exerted by a wind blowing against a flat surface. A is the area of the surface in square feet, and v is the wind velocity in miles per hour. How much force is exerted by a wind blowing at 85 mi/h against the side of the building shown?



Not drawn to scale

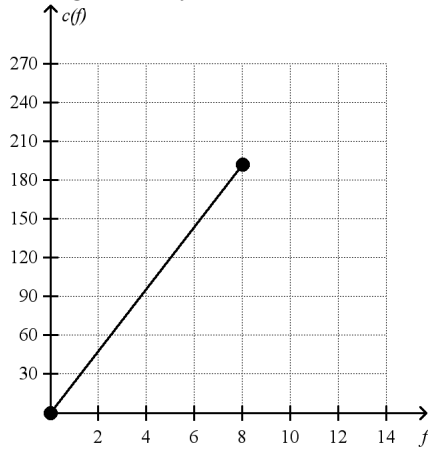
a. about 53 tons
b. about 10,549 tons
c. about 5 tons
d. about 23 tons

____ 11. Write a function rule for the area, A, of a triangle whose base, b, is 2 cm less than seven times the height, h. What is the area of the triangle when the height is 14 cm?

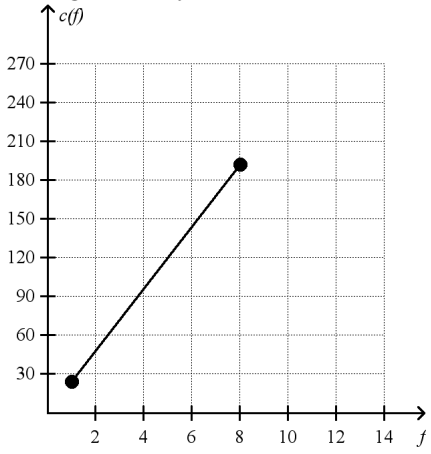
a. $A = \frac{7h^2 - 2h}{2}$; 672 cm^2
b. $A = \frac{7h - 2}{2}$; 48 cm^2
c. $A = 7h - 2$; 96 cm^2
d. $A = 7h^2 - 2h$; 1344 cm^2

____ 12. You have 8 cups of flour. It takes 1 cup of flour to make 24 cookies. The function $c(f) = 24f$ represents the number of cookies, c, that can be made with f cups of flour. What domain and range are reasonable for the function? What is the graph of the function?

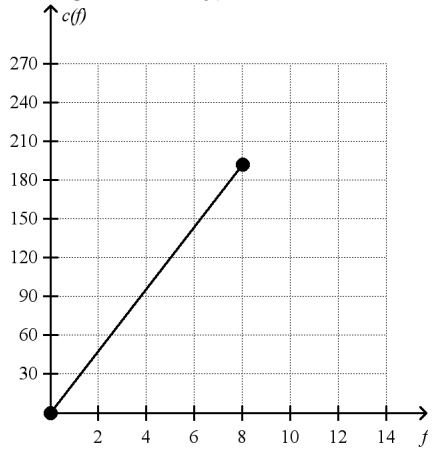
a. The domain is $0 \le c(f) \le 192$.
The range is $0 \le f \le 8$.



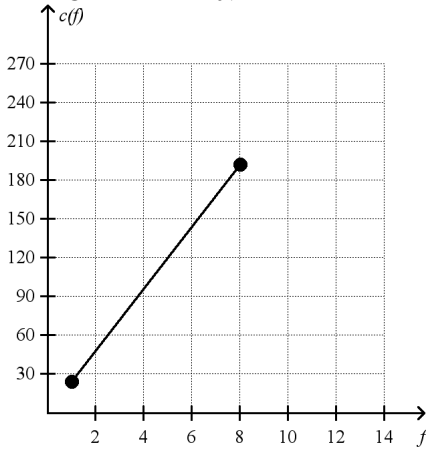
c. The domain is $24 \le c(f) \le 192$.
The range is $1 \le f \le 8$.



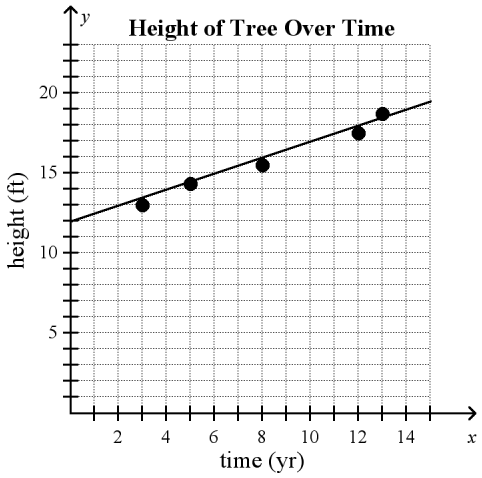
b. The domain is $0 \le f \le 8$.
The range is $0 \le c(f) \le 192$.



d. The domain is $1 \le f \le 8$.
The range is $24 \le c(f) \le 192$.



____ 13. The scatter plot below shows the height of a tree over time. What is the approximate height of the tree after 10 years?



a. 13 ft
b. 20 ft
c. 17 ft
d. 21 ft

Short Answer - SHOW ALL YOUR WORK!

What is the graph of each function rule?

14. $y = |x| - 1$

15. $y = |3x| - 1$

16. $y = 2x^2 - 2$

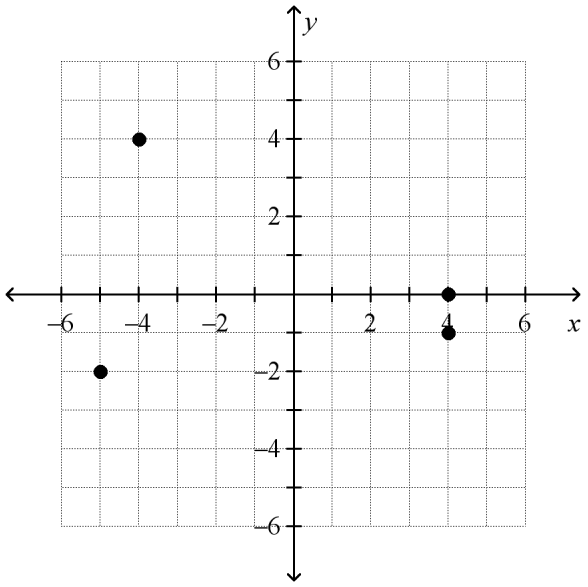
17. $y = x^2 + 1$

Use the vertical line test to determine whether the relation is a function.

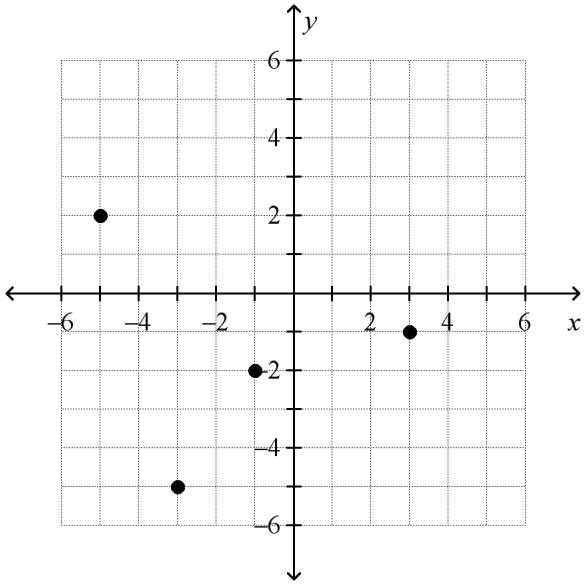
18. $\{(0, -1), (-5, 1), (-3, -3), (-5, -5)\}$

19. $\{(3, 0), (2, -1), (-1, 4), (1, -2)\}$

20.



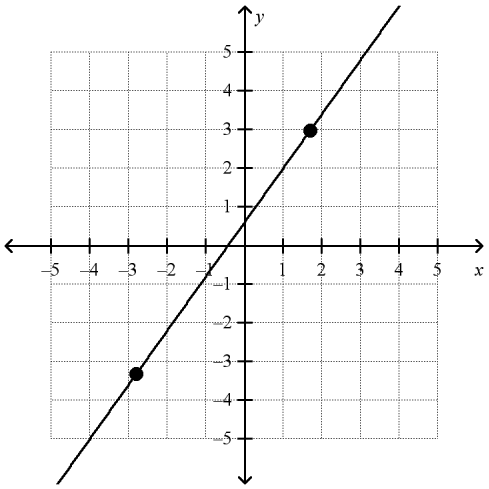
21.



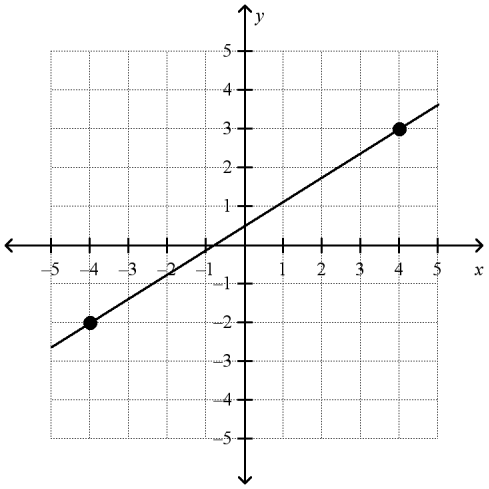
22. The function $g(t) = 2t$ represents the number of guitar lessons, $g(t)$, you can complete in t months. How many guitar lessons can you complete in 7 months?

Write the slope-intercept form of the equation for the line.

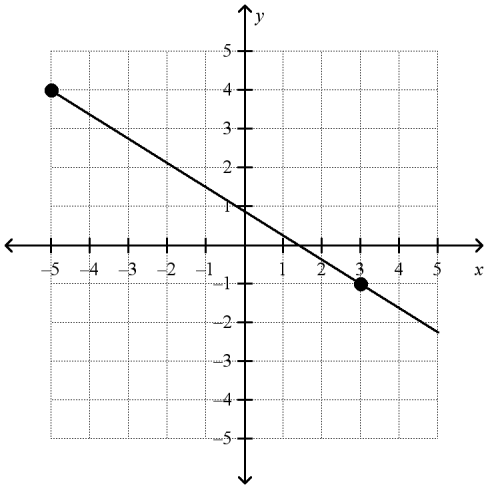
23.



24.



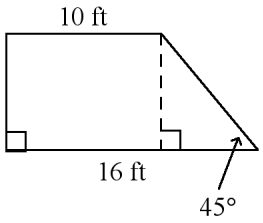
25.



26. Identify the domain and range of the relation.
$\{(-9, 2), (-4, 2), (3, 2), (9, 2)\}$

Find the area of the figure.

27.



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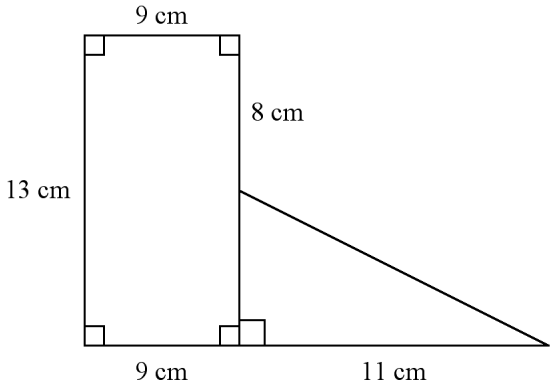
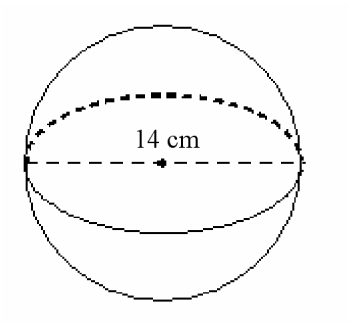
28.



Find the volume of the sphere shown. Give each answer rounded to the nearest cubic unit.

29.



What is the slope of the line that passes through the pair of points?

30. (–5.5, 6.1), (–2.5, 3.1)

31. $(-\frac{5}{3}, -1), (-2, \frac{9}{2})$

32. (1, 7), (10, 1)

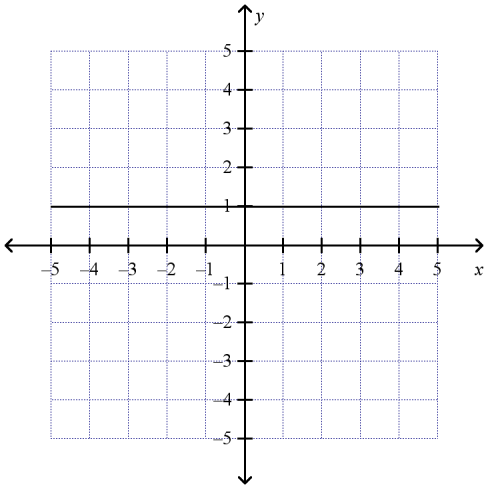
Graph the equation.

33. $y = -2x - 3$

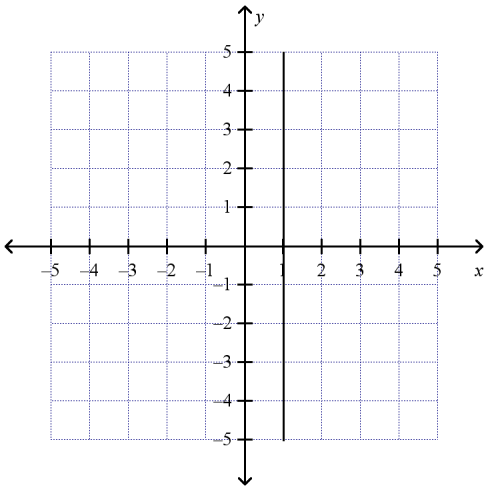
34. $y = 4x - 3$

What is the slope of the line?

35.



36.



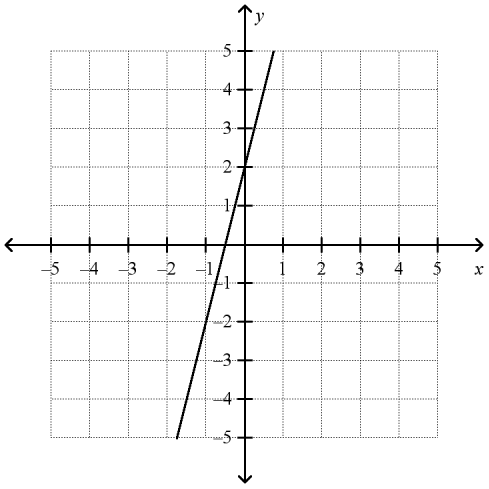
Graph the equation.

37. $y - 1 = \frac{4}{5}(x + 1)$

38. $y - 4 = 2(x - 2)$

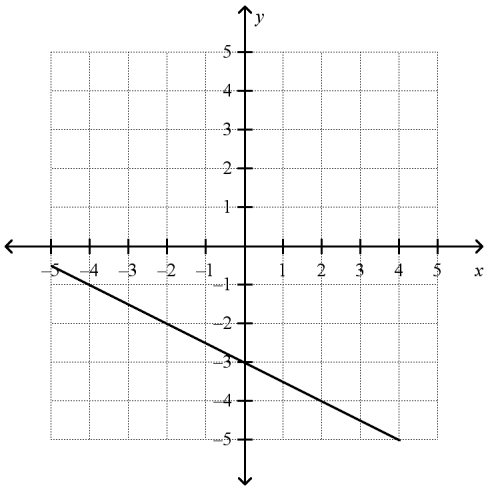
39. $y - 4 = -5(x + 1)$

40. What do you expect the slope of the line to be from looking at the graph?



Find the slope of the line.

41.



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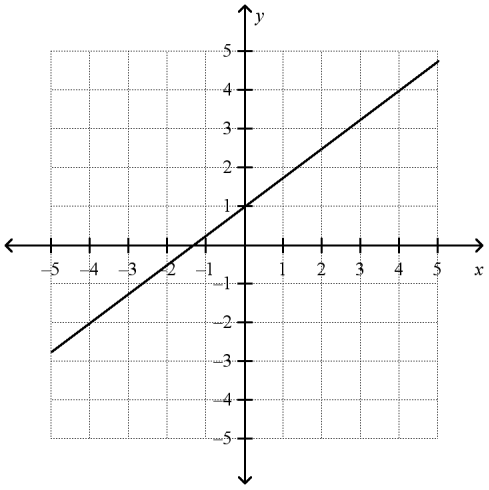
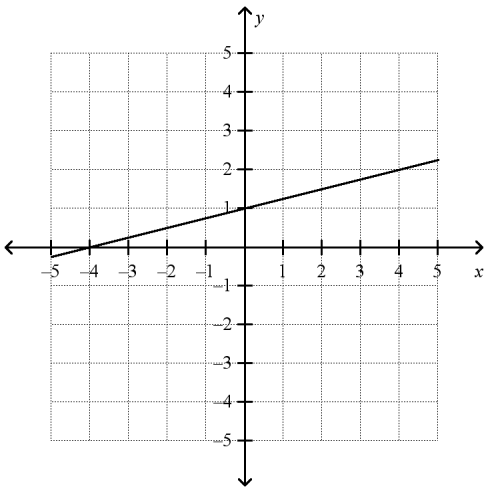


43.



Write an equation of a line with the given slope and *y*-intercept.

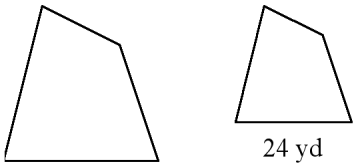
44. $m = \frac{3}{5}$, $b = \frac{1}{3}$

45. $m = -4.4$, $b = 6.8$

46. $m = -5$, $b = -3$

The figures are similar. Give the ratio of the perimeter and the ratio of the areas of the first figure to the second. The figures are not to scale.

47.



48. A zucchini plant in Darnell's garden was 12 centimeters tall when it was first planted. Since then, it has grown approximately 0.5 centimeter per day.
    - Write a rule to describe the function.
    - After how many days will the zucchini plant be 0.185 meter tall?

What are the slope and *y*-intercept of the graph of the given equation?

49. $y = -4x + 2$

50. $y = 1.9x + 2.5$

51. $y = \frac{8}{9}x - \frac{10}{3}$

52. Giselle pays $240 in advance on her account at the athletic club. Each time she uses the club, $15 is deducted from the account. Model the situation with a linear function and a graph.

53. A taxi company charges passengers $1.00 for a ride, and an additional $0.30 for each mile traveled. The function rule $C = 0.30m + 1.00$ describes the relationship between the number of miles m and the total cost of the ride c. If the taxi company will only go a maximum of 40 miles, what is a reasonable graph of the function rule?

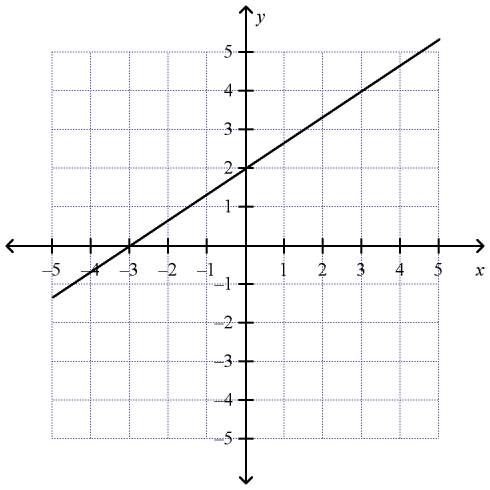
54. Crystal earns $5.50 per hour mowing lawns.
    - Write a rule to describe how the amount of money m earned is a function of the number of hours h spent mowing lawns.
    - How much does Crystal earn if she works 3 hours and 45 minutes?

What is the graph of the function rule?

55. $y = 3x - 2$

56. Find the range of $f(x) = -4.7x + 1$ for the domain $\{-1, 3, 5, 8\}$.

57. The graph below represents one function, and the table represents a different function. How are the functions similar? How are they different?



x	−2	−1	0	1	2
y	0	1	2	3	4

The table shows the relationship between the number of sports teams a person belongs to and the amount of free time the person has per week.

Number of Sports Teams	Free Time (hours)
0	46
1	39
2	32
3	25

58. Describe the above relationship using words. What is the equation for this relationship?

The rate of change is constant in each table. Find the rate of change. Explain what the rate of change means for the situation.

59. The table shows the cost of a ski rental package for a given number of people.

People	Cost ($)
4	160
5	200
6	240
7	280

60. The table shows the number of miles driven over time.

Time (hours)	Distance (miles)
4	204
6	306
8	408
10	510

61. A balloon has a circumference of 11 cm. Use the circumference to approximate the surface area of the balloon to the nearest square centimeter.

What is the graph of the equation?

62. $x = 1$

63. $y = -2$

64. Identify the domain and range of the relation.
$\{(-4, 2), (-9, -5), (-4, 12), (8, -8)\}$

65. The area of a parallelogram is 280 cm^2 and the height is 35 cm. Find the corresponding base.

66. The table shows the height of an elevator above ground level after a certain amount of time. Model the data with an equation. Let y stand for the height of the elevator in feet and let x stand for the time in seconds.

Time (s)	Height (ft)
10	202
20	184
40	148
60	112

Find the surface area of the sphere with the given dimension. Leav your answer in terms of $\prod$.

67. Diameter of 14 cm

What equation in slope intercept form represents the line that passes through the two points?

68. (6.6, –2.5), (8.6, –10.5)

69. $(-\frac{3}{4}, -\frac{10}{3}), (-\frac{2}{3}, -\frac{1}{3})$

Find the *x*- and *y*-intercept of the line.

70. $-2.9x + 5.4y = 140.94$

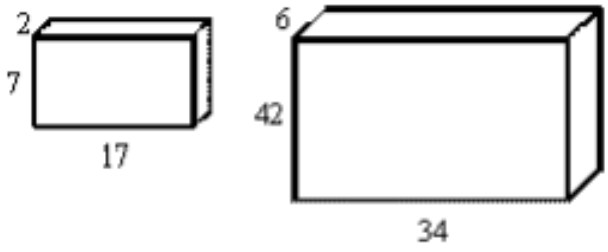
71. $-\frac{7}{5}x - 4y = 7$

72. $-4x + 2y = 24$

73. A snail travels at a rate of 2.35 feet per minute.
    - Write a rule to describe the function.
    - How far will the snail travel in 5 minutes?

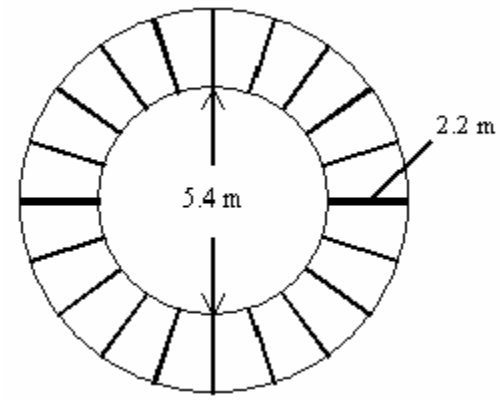
Are the two figure similar? If so, give the similarity ratio of the smaller figure to the larger figure?

74.



Not drawn to scale

75. The figure represents the overhead view of a deck surrounding a hot tub. What is the area of the deck? Round to the nearest tenth.

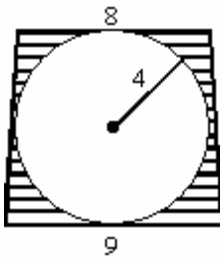


76. Write a function rule that gives the total cost $c(p)$ of p pounds of sugar if each pound costs \$.59.

77. Will the graph of the line represented by the table intersect the graph of $y = 5x + 4$? Explain.

x	−2	−1	0	1	2
y	−5	0	5	10	15

78. Find the area of the shaded portion of the figure. Dimensions are in feet. Leave your answer in terms of π. The figure is not drawn to scale.



79. Find the range of $f(x) = -2x + 6$ for the domain $\{-1, 3, 7, 9\}$.

80. The table shows the height of a plant as it grows. What equation in point-slope form gives the plant's height at any time? Let y stand for the height of the plant in cm and let x stand for the time in months.

Time (months)	**Plant Height (cm)**
3	15
5	25
7	35
9	45

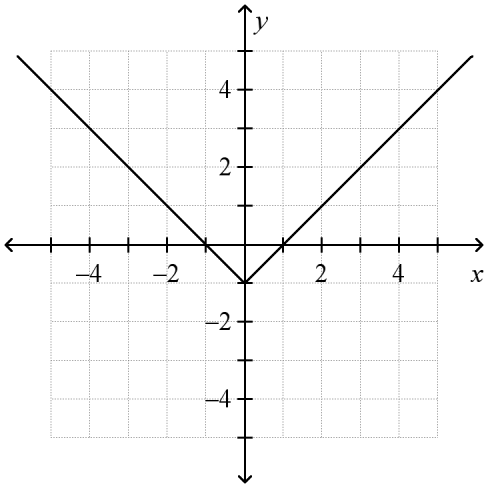
SREB UNIT 1 - 4 STUDY GUIDE
Answer Section

MULTIPLE CHOICE

1. ANS: A PTS: 1 DIF: L2
   REF: 4-6 Formalizing Relations and Functions
2. ANS: C PTS: 1 DIF: L3
   REF: 4-3 Patterns and Nonlinear Functions
3. ANS: D PTS: 1 DIF: L3
   REF: 4-3 Patterns and Nonlinear Functions
4. ANS: C PTS: 1 DIF: L3 REF: 5-5 Standard Form
5. ANS: B PTS: 1 DIF: L3 REF: 5-5 Standard Form
6. ANS: A PTS: 1 DIF: L2
   REF: 4-6 Formalizing Relations and Functions
7. ANS: A PTS: 1 DIF: L3
   REF: 4-3 Patterns and Nonlinear Functions
8. ANS: A PTS: 1 DIF: L3 REF: 4-2 Patterns and Linear Functions
9. ANS: B PTS: 1 DIF: L3 REF: 4-2 Patterns and Linear Functions
10. ANS: C PTS: 1 DIF: L4
    REF: 10-1 Areas of Parallelograms and Triangles
11. ANS: A PTS: 1 DIF: L3 REF: 4-5 Writing a Function Rule
12. ANS: B PTS: 1 DIF: L3
    REF: 4-6 Formalizing Relations and Functions
13. ANS: C PTS: 1 DIF: L3 REF: 5-7 Scatter Plots and Trend Lines

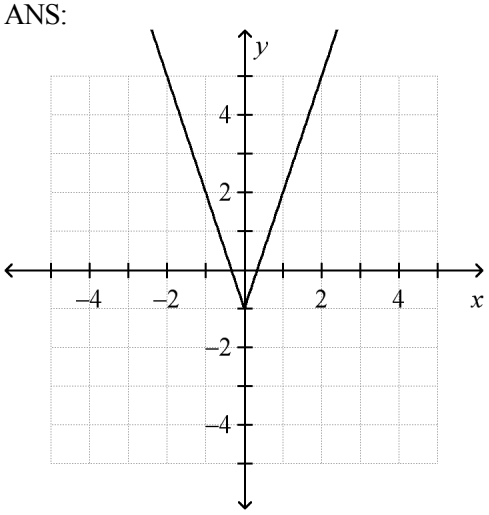
SHORT ANSWER

14. ANS:



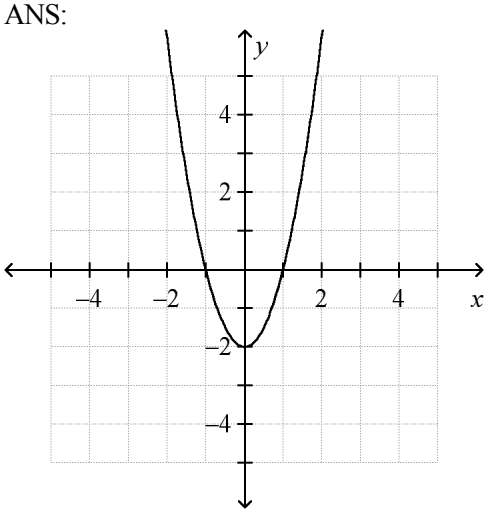
PTS: 1 DIF: L2 REF: 4-4 Graphing a Function Rule

15. ANS:



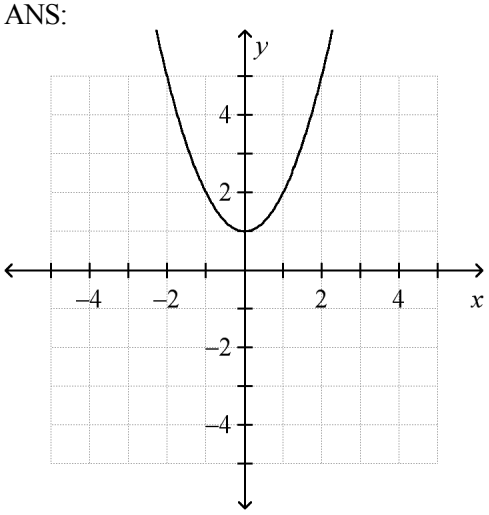
PTS: 1 DIF: L3 REF: 4-4 Graphing a Function Rule

16. ANS:



PTS: 1 DIF: L3 REF: 4-4 Graphing a Function Rule

17. ANS:



PTS: 1 DIF: L2 REF: 4-4 Graphing a Function Rule

18. ANS:
The relation is not a function.

PTS: 1 DIF: L3 REF: 4-6 Formalizing Relations and Functions

19. ANS:
The relation is a function.

PTS: 1 DIF: L3 REF: 4-6 Formalizing Relations and Functions

20. ANS:
The relation is not a function.

PTS: 1 DIF: L2 REF: 4-6 Formalizing Relations and Functions

21. ANS:
The relation is a function.

PTS: 1 DIF: L2 REF: 4-6 Formalizing Relations and Functions

22. ANS:
You can complete 14 guitar lessons in 7 months.

PTS: 1 DIF: L3 REF: 4-6 Formalizing Relations and Functions

23. ANS:
$y = 1.4x + 0.6$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

24. ANS:
$y = \frac{5}{8}x + \frac{1}{2}$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

25. ANS:
$y = -\frac{5}{8}x + \frac{7}{8}$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

26. ANS:
The domain is {–9, –4, 3, 9}.
The range is {2}.

PTS: 1 DIF: L3 REF: 4-6 Formalizing Relations and Functions

27. ANS:
78 ft^2

PTS: 1 DIF: L3 REF: 10-2 Areas of Trapezoids, Rhombuses, and Kites

28. ANS:
144.5 cm^2

PTS: 1 DIF: L3 REF: 10-1 Areas of Parallelograms and Triangles

29. ANS:
1,437 cm^3

PTS: 1 DIF: L3 REF: 11-6 Surface Areas and Volumes of Spheres

30. ANS:
–1

PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

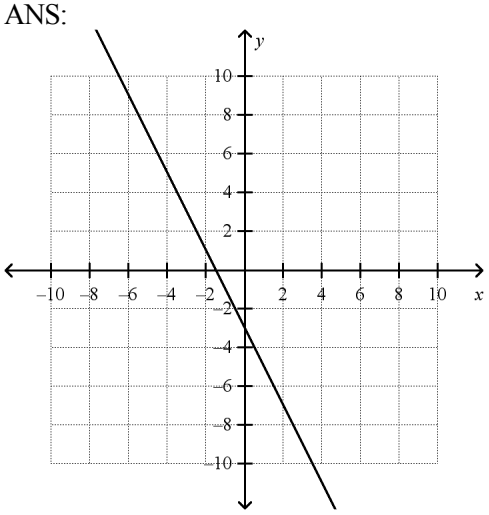
31. ANS:
$-\frac{33}{2}$

PTS: 1 DIF: L4 REF: 5-1 Rate of Change and Slope

32. ANS:
$-\frac{2}{3}$

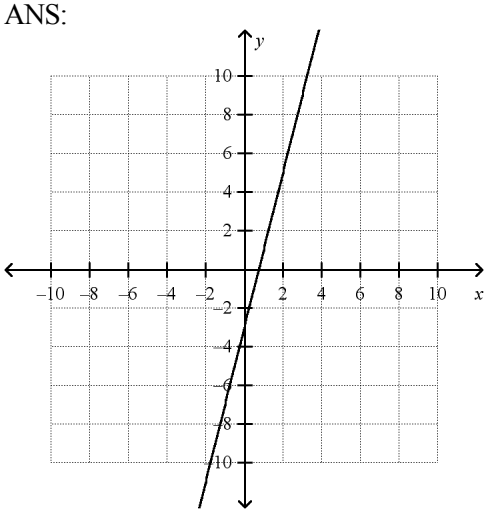
PTS: 1 DIF: L2 REF: 5-1 Rate of Change and Slope

33. ANS:



PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

34. ANS:



PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

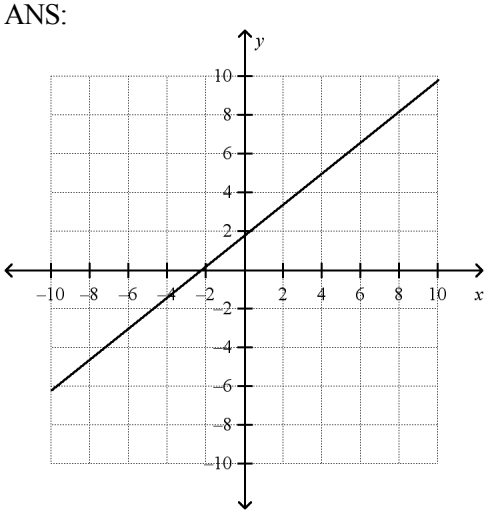
35. ANS:
0

PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

36. ANS:
undefined

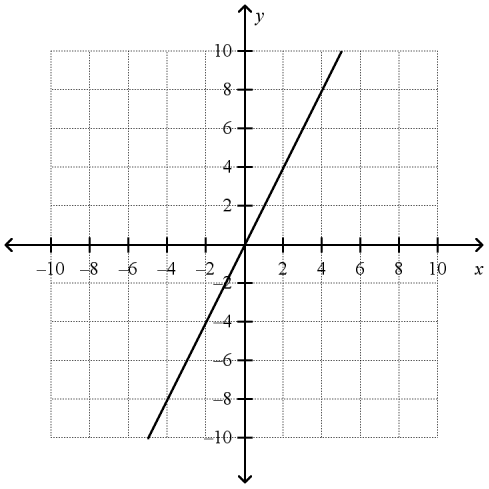
PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

37. ANS:



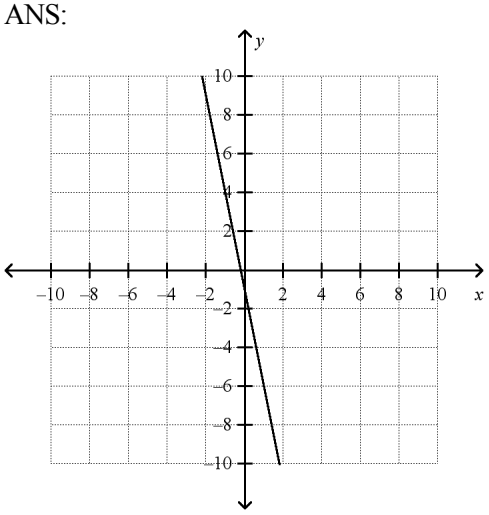
PTS: 1 DIF: L3 REF: 5-4 Point-Slope Form

38. ANS:



PTS: 1 DIF: L3 REF: 5-4 Point-Slope Form

39. ANS:



PTS: 1 DIF: L3 REF: 5-4 Point-Slope Form

40. ANS:
The slope is positive

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

41. ANS:
$-\frac{1}{2}$

PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

42. ANS:
$\frac{3}{4}$

PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

43. ANS:
$\frac{1}{4}$

PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

44. ANS:
$y = \frac{3}{5}x + \frac{1}{3}$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

45. ANS:
$y = -4.4x + 6.8$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

46. ANS:
$y = -5x - 3$

PTS: 1 DIF: L2 REF: 5-3 Slope-Intercept Form

47. ANS:
$\frac{9}{8}$ and $\frac{81}{64}$

PTS: 1 DIF: L3 REF: 10-4 Perimeters and Areas of Similar Figures

48. ANS:
$h(d) = 0.5d + 12$; 13 days

PTS: 1 DIF: L4 REF: 4-5 Writing a Function Rule

49. ANS:
The slope is -4 and the y-intercept is 2.

PTS: 1 DIF: L2 REF: 5-3 Slope-Intercept Form

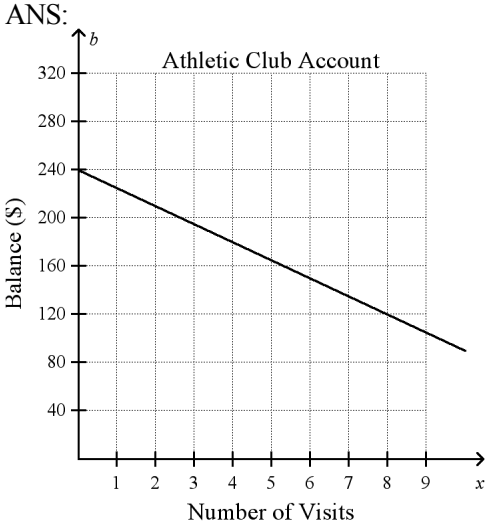
50. ANS:
The slope is 1.9 and the y-intercept is 2.5.

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

51. ANS:
The slope is $\frac{8}{9}$ and the y-intercept is $-\frac{10}{3}$.

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

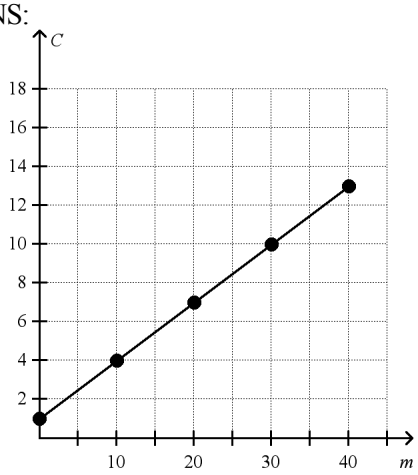
52. ANS:



$b = 240 - 15x$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

53. ANS:

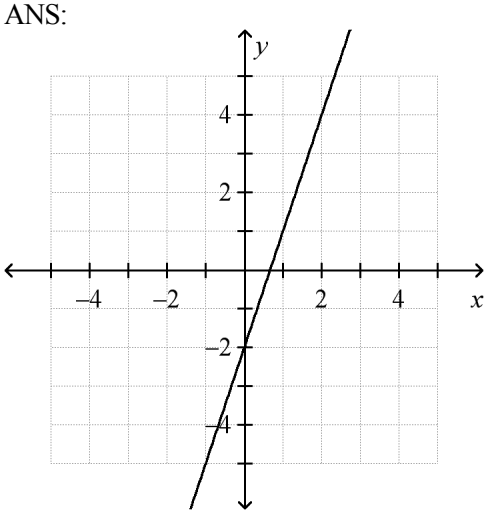


PTS: 1 DIF: L3 REF: 4-4 Graphing a Function Rule

54. ANS:
$m(h) = 5.50h$; \$20.63

PTS: 1 DIF: L3 REF: 4-5 Writing a Function Rule

55. ANS:



PTS: 1 DIF: L2 REF: 4-4 Graphing a Function Rule

56. ANS:
{5.7, –13.1, –22.5, –36.6}

PTS: 1 DIF: L3 REF: 4-6 Formalizing Relations and Functions

57. ANS:
The functions have the same y-intercept but different slopes.

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

58. ANS:
For every sports team the person joins, he or she spends 7 hours per week practicing. So, the amount of free time the person has, F, is the amount of free time they would have if they did not belong to any sports teams minus 7 times the number of teams they belong to. In equation form this is $F = 46 - 7n$.

PTS: 1 DIF: L3 REF: 4-2 Patterns and Linear Functions

59. ANS:
$\frac{40}{1}$ dollars per person; the cost is \$40 for each person.

PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

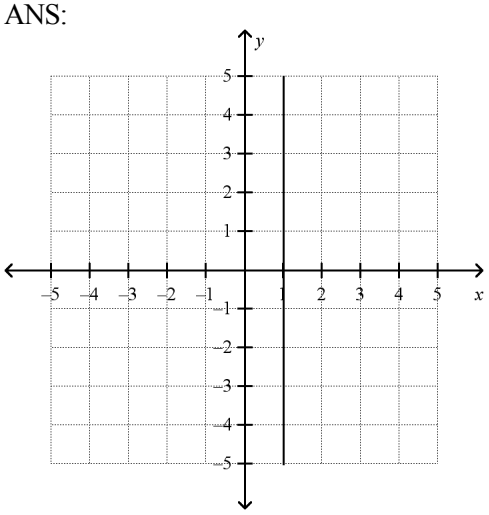
60. ANS:
$\frac{51}{1}$; Your car travels 51 miles every 1 hour.

PTS: 1 DIF: L3 REF: 5-1 Rate of Change and Slope

61. ANS:
39 cm^2

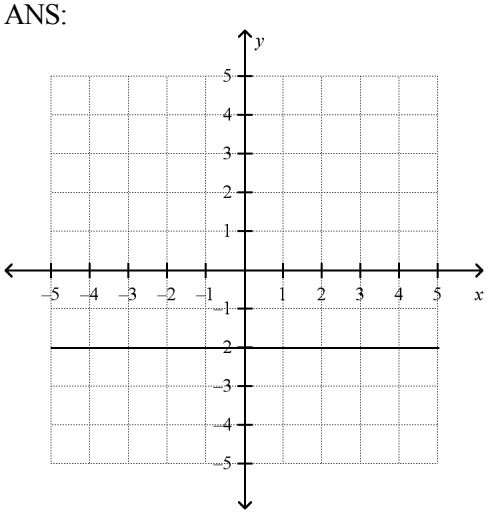
PTS: 1 DIF: L3 REF: 11-6 Surface Areas and Volumes of Spheres

62. ANS:



PTS: 1 DIF: L3 REF: 5-5 Standard Form

63. ANS:



PTS: 1 DIF: L3 REF: 5-5 Standard Form

64. ANS:
The domain is {–9, –4, 8}.
The range is {–8, –5, 2, 12}.

PTS: 1 DIF: L3 REF: 4-6 Formalizing Relations and Functions

65. ANS:
8 cm

PTS: 1 DIF: L3 REF: 10-1 Areas of Parallelograms and Triangles

66. ANS:
$y = -1.8x + 220$

PTS: 1 DIF: L3 REF: 5-4 Point-Slope Form

67. ANS:

$196\pi \text{ cm}^2$

PTS: 1 DIF: L3 REF: 11-6 Surface Areas and Volumes of Spheres

68. ANS:
$y = -4x + 23.9$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

69. ANS:

$y = 36x + \frac{71}{3}$

PTS: 1 DIF: L3 REF: 5-3 Slope-Intercept Form

70. ANS:
x-intercept is –48.6; y-intercept is 26.1

PTS: 1 DIF: L3 REF: 5-5 Standard Form

71. ANS:
x-intercept is -5; y-intercept is $-\frac{7}{4}$

PTS: 1 DIF: L3 REF: 5-5 Standard Form

72. ANS:
x-intercept is -6; y-intercept is 12

PTS: 1 DIF: L2 REF: 5-5 Standard Form

73. ANS:
$d(t) = 2.35t$; 11.75 ft

PTS: 1 DIF: L2 REF: 4-5 Writing a Function Rule

74. ANS:
no

PTS: 1 DIF: L3 REF: 11-7 Areas and Volumes of Similar Solids

75. ANS:
52.5 m^2

PTS: 1 DIF: L4 REF: 10-7 Areas of Circles and Sectors

76. ANS:
$c(p) = 0.59p$

PTS: 1 DIF: L3 REF: 4-5 Writing a Function Rule

77. ANS:
No, because the slopes are the same by the y-intercepts are different. The lines are parallel.

PTS: 1 DIF: L3 REF: 5-6 Parallel and Perpendicular Lines

78. ANS:
$(68 - 16\pi)$ ft^2

PTS: 1 DIF: L4 REF: 10-7 Areas of Circles and Sectors

79. ANS:
$\{8, 0, -8, -12\}$

PTS: 1 DIF: L3 REF: 4-6 Formalizing Relations and Functions

80. ANS:
$y - 15 = 5(x - 3)$

PTS: 1 DIF: L3 REF: 5-4 Point-Slope Form