

Algebra 1: Semester 1 Review Packet for chapters 4, 5, and 6

46. An 8-ounce bottle of lotion costs \$4.50. What is the cost per ounce?

$$\frac{\$}{\text{oz}} = \frac{4.50}{8} = \$0.5625 \approx \$0.56/\text{oz} \approx 56c/\text{oz}$$

47. A pound of coffee costs \$14.99. What is the cost per ounce?

$$\frac{\$}{\text{lb}} = \frac{14.99}{16} = \$0.9368 \approx \$0.94/\text{lb} \approx 94c/\text{lb}$$

48. Solve $\frac{x-1}{-4} = \frac{2}{3}$

$$\frac{(x-1)}{(-4)} = \frac{(2)}{(3)}$$

$$(x-1)(3) = (-4)(2).$$

$$3x-3 = -8$$

$$+3 = +3$$

$$3x = -5$$

$$\frac{3x}{3} = \frac{-5}{3}$$

$$x = \frac{-5}{3}$$

49. Solve $\frac{3}{6} = \frac{x-3}{8}$

$$\frac{(3)}{(6)} = \frac{(x-3)}{(8)}$$

$$(3)(8) = (x-3)(6)$$

$$24 = 6x - 18$$

$$6x - 18 = 24$$

$$+18 = +18$$

$$6x = 42$$

$$\frac{6x}{6} = \frac{42}{6}$$

$$x = 7$$

50. A canary's heart beats 130 times in 12 seconds. Use a proportion to find out how many times its heart beats in 50 seconds.

$$\frac{\text{ht beat}}{\text{seconds}} = \frac{(130)}{(12)} = \frac{(x)}{(50)}$$

$$(12)(x) = (130)(50)$$

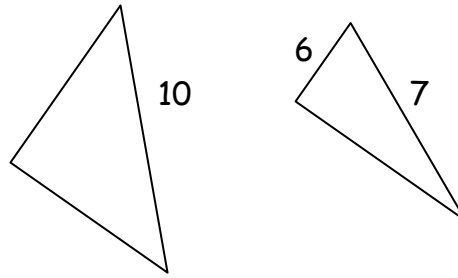
$$12x = 6500$$

$$\frac{12x}{12} = \frac{6500}{12}$$

$$x = 541.66$$

$$x \approx 542$$

51. Using the similar figures, find x.



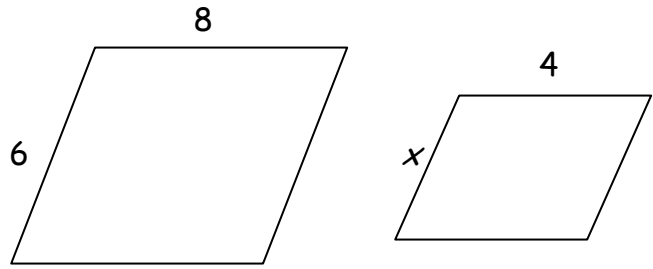
$$\frac{\text{Leg}}{\text{long}} \quad \begin{array}{l} \text{Large} \\ \text{Small} \end{array} \quad \frac{x}{10} = \frac{6}{7}$$

$$7x = 60$$

$$\frac{7x}{7} = \frac{60}{7}$$

$$x = \frac{60}{7} \approx 8.57$$

52. Using the similar figures, find x.



$$\begin{array}{l} \text{Large} \\ \text{Small} \end{array} \quad \frac{\text{top}}{\text{side}} = \frac{8}{6} = \frac{4}{x}$$

$$8x = 24$$

$$\frac{8x}{8} = \frac{24}{8}$$

$$x = 3$$

53. A blueprint scale is 1 in : 12 ft. The width of a building is 48 feet. What is the width of the building on the blueprint?

$$\frac{\text{scale}}{\text{actual}} \quad \begin{array}{l} \text{Map} \\ \text{Building} \end{array} \quad \frac{1 \text{ in}}{12 \text{ ft}} = \frac{x}{48 \text{ ft}}$$

$$12x = 48$$

$$\frac{12x}{12} = \frac{48}{12}$$

$$x = 4 \text{ in}$$

54. A map has a scale of 1 in: 25 mi. Two cities are 175 miles apart. How far apart are they on the map?

$$\frac{\text{scale}}{\text{actual}} = \frac{\text{Map}}{\text{Route}}$$

$$\frac{\text{1 in}}{25 \text{ miles}} = \frac{x}{175 \text{ miles}}$$

$$25x = 175 \text{ miles}$$

$$\frac{25x}{25} = \frac{175}{25}$$

$$x = 7 \text{ in}$$

55. 25% of what is 28?

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

$$\frac{28}{x} = \frac{25}{100}$$

$$25x = 2800$$

$$\frac{25x}{25} = \frac{2800}{25}$$

$$x = 112$$

56. 60% of what is 45?

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

$$\frac{45}{x} = \frac{60}{100}$$

$$60x = 4500$$

$$\frac{60x}{60} = \frac{4500}{60}$$

$$x = 75$$

57. What is 250% of 14?

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

$$\frac{x}{14} = \frac{250}{100}$$

$$100x = 3500$$

$$\frac{100x}{100} = \frac{3500}{100}$$

$$x = 35$$

58. You spent 16% of your vacation money on food. If you spent \$48 on food, how much money did you spend on your vacation?

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

$$\frac{48}{x} = \frac{16}{100}$$

$$16x = 4800$$

$$\frac{16x}{16} = \frac{4800}{16}$$

$$x = \$300$$

59. Sarah spends 30% of her monthly income on rent. If she pays \$810 for rent each month, what is her monthly income?

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

$$\frac{810}{x} = \frac{30}{100}$$

$$30x = 81000$$

$$\frac{30x}{30} = \frac{81000}{30}$$

$$x = \$2700$$

60. In 1980, the average annual tuition charge for a four-year public university was \$840. The average annual tuition charge in 2000 was \$3356. What is the percent of change?

$$\begin{aligned} \text{Percent of change} &= \frac{\text{amount of change}}{\text{original amount}} \\ \frac{\text{amount of change}}{\text{original amount}} &= \frac{3356 - 840}{840} \\ &= \frac{2516}{840} \\ &= 2.995238 \\ &= 299.5238\% \\ &\approx 300\% \end{aligned}$$

61. The United States imported 6,909,000 barrels of oil per day in 1980. In 2000, the U.S. imported 11,459,000 barrels of oil per day. What is the percent of change?

$$\begin{aligned} \text{Percent of change} &= \frac{\text{amount of change}}{\text{original amount}} \\ \frac{\text{amount of change}}{\text{original amount}} &= \frac{11,459,000 - 6,909,000}{6,909,000} \\ &= \frac{4,550,000}{6,909,000} \\ &= 0.6585612 \\ &= 65.85612\% \\ &\approx 66\% \end{aligned}$$

62. Find the domain and range of the relation: $\{(-3, -7), (-1, -3), (0, -1), (2, 3), (4, 7)\}$

$$\text{Domain} = \{-3, -1, 0, 2, 4\}$$

$$\text{Range} = \{-7, -3, -1, 3, 7\}$$

63. Find the domain and range of the relation: $\{(-5, -4), (-4, 2), (0, 2), (1, 3), (2, 4)\}$

$$\text{Domain} = \{-5, -4, 0, 1, 2\}$$

$$\text{Range} = \{-4, 2, 3, 4\}$$

$$f(x) = 2x - 15$$

$$f(3) = 2(3) - 15$$

64. Evaluate the function for $x = 3$

$$f(3) = 6 - 15$$

$$f(3) = -9$$

$$f(x) = -x + 3$$

$$f(-4) = -(-4) + 3$$

65. Evaluate the function for $x = -4$

$$f(-4) = 4 + 3$$

$$f(-4) = 7$$

66. Find the range of the function for the given domain:

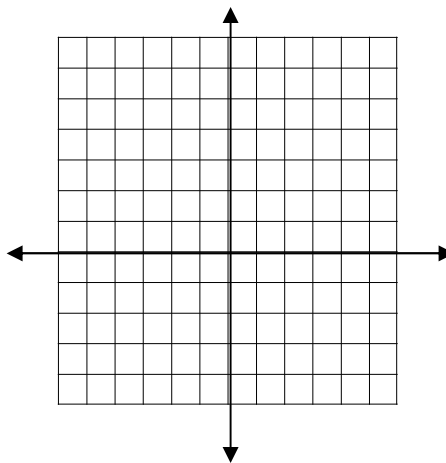
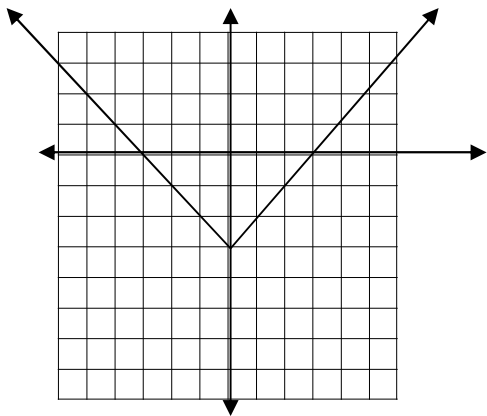
$$\text{domain } \{-2, -1, 0\} \quad f(x) = -3x + 1$$

$$\text{Range} = \{1, 4, 7\}$$

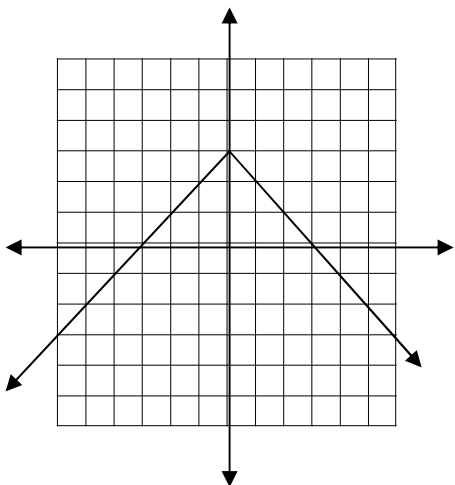
Use a table of values to graph each of the following:

67. $y = |x| - 3$

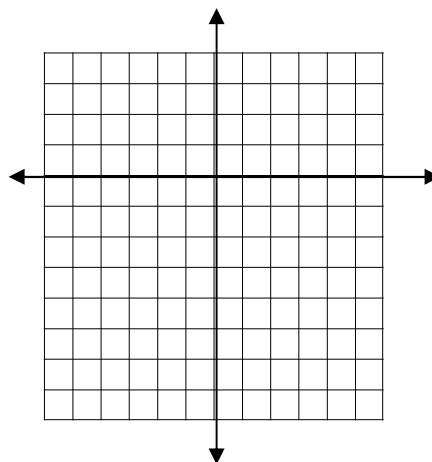
68. $y = x^2 - 4$



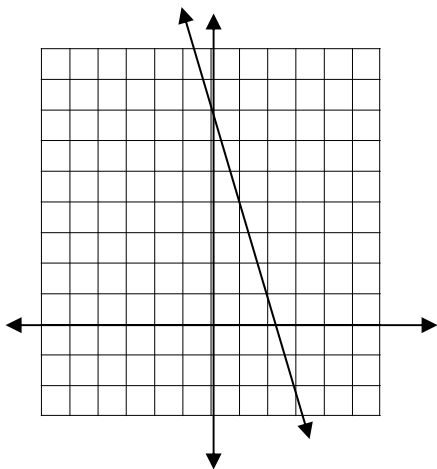
69. $y = -|x| + 3$



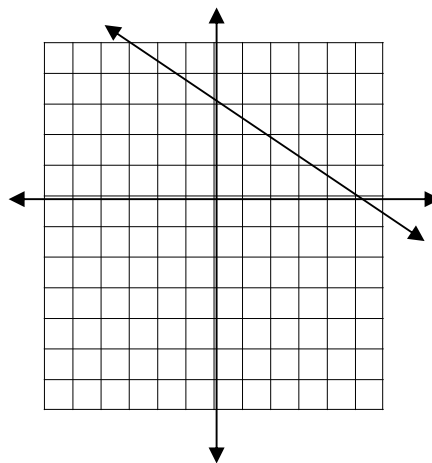
70. $f(x) = -x^2 + 2$



71. Graph $f(x) = -3x + 7$



72. Graph $f(x) = -\frac{1}{2}x + 3$



For 73 and 74, write a function rule for the table:

73.

x	y
0	0
1	3
2	6
3	9

$y = 3x$

74.

x	f(x)
0	-1
1	0
2	1
3	2

$y = x - 1$

For 75 and 76, find the common difference of the arithmetic sequence.

75. 9, 10.5, 12, 13.5,...

+ 1.5

76. 1, -1.5, -4, -6.5,...

-2.5

For 77 and 78, find the fifth, tenth, and hundredth term of the sequence.

77. $A(n) = 4 + (n-1)(10)$

$A(5) = 4 + (5-1)(10)$

$A(5) = 4 + (4)(10)$

$A(5) = 4 + (40)$

$A(5) = 44$

$A(10) = 4 + (10-1)(10)$

$A(10) = 4 + (9)(10)$

$A(10) = 4 + (90)$

$A(10) = 94$

$A(100) = 4 + (100-1)(10)$

$A(100) = 4 + (99)(10)$

$A(100) = 4 + (990)$

$A(100) = 994$

78. $A(n) = 14 + (n-1)(-8)$

$A(5) = 14 + (5-1)(-8)$

$A(5) = 14 + (4)(-8)$

$A(5) = 14 - 32$

$A(5) = -18$

$A(10) = 14 + (10-1)(-8)$

$A(10) = 14 + (9)(-8)$

$A(10) = 14 + (-72)$

$A(10) = -58$

$A(100) = 14 + (100-1)(-8)$

$A(100) = 14 + (99)(-8)$

$A(100) = 14 + (-792)$

$A(100) = -778$

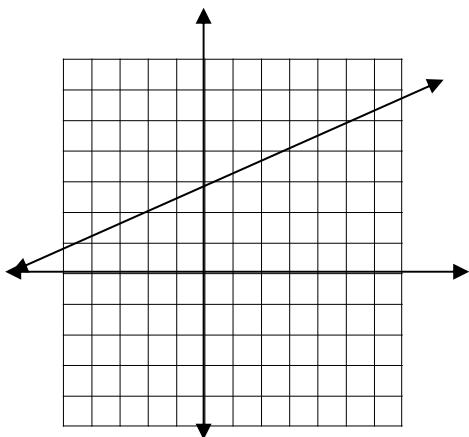
79. Determine whether or not the sequence is arithmetic. Explain your answer.

3, 6, 12, 24,...

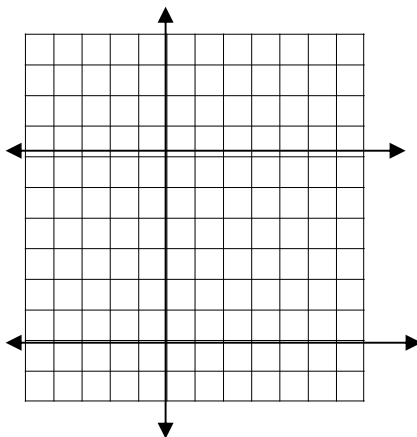
**No it is not an arithmetic sequence,
there is no constant of variation.**

For 80, 81, and 82, Graph using the slope and y-intercept:

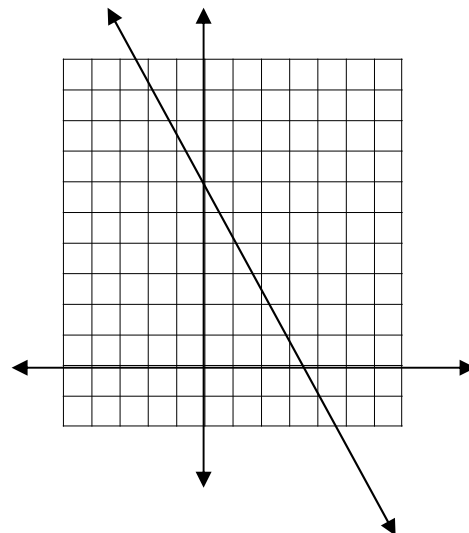
80. $y = \frac{2}{5}x + 3$



81. $y = -6$



82. $y = \frac{-7}{4}x + 6$



83. Write an equation for the line with the given slope and y-intercept.

$m = 4$ $b = 8$

$Y = 4x + 8$

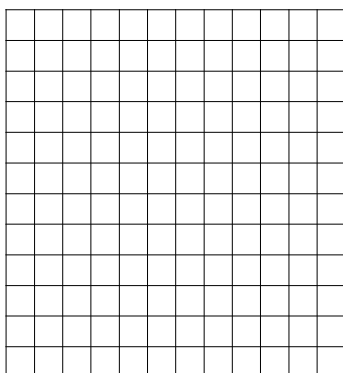
84. Write an equation for the line with the given slope and y-intercept.

$m = -1$, $b = -3$

$y = -1x - 3$ or $y = -x - 3$

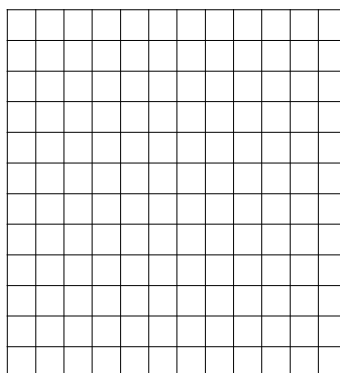
For 85, 86, and 87, write an equation for each line.

85.



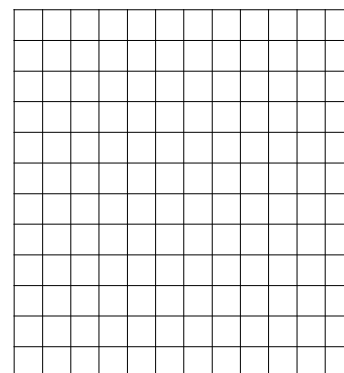
$x = -2$

86.



$x + 3y = 6$

87.



$2x - 3y = 6$

88. Write the equation in standard form:

$$y = \frac{-x}{3} + \frac{2}{3}$$
$$3 \left[\frac{y}{1} = \frac{-x}{3} + \frac{2}{3} \right]$$
$$3 \left(\frac{y}{1} \right) = 3 \left(\frac{-x}{3} \right) + 3 \left(\frac{2}{3} \right)$$
$$3y = -1x + 2$$
$$+1x \quad = +1x$$
$$1x + 3y = 2$$

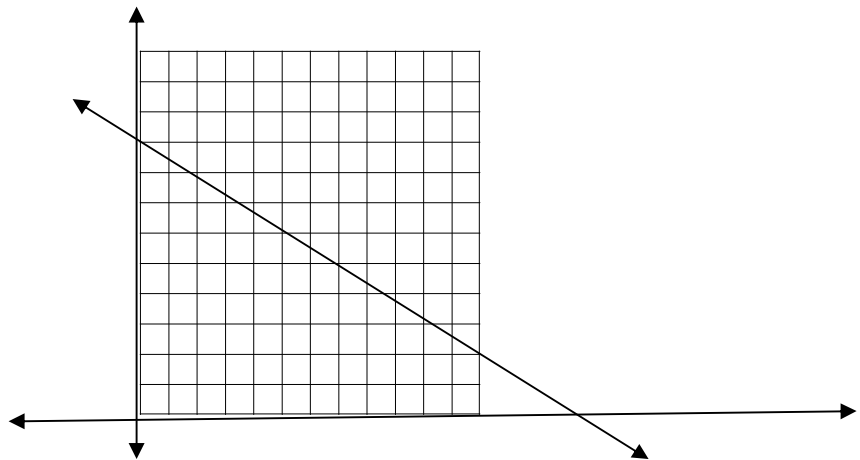
89. The student council is sponsoring a carnival to raise money. Tickets cost \$5 for adults and \$3 for students. The student council wants to raise \$450.

A) Write an equation to find the number of adult and student tickets they should sell.

x = student y = adults

$$3x + 5y = \$450$$

B) Graph your equation using x- and y-intercepts. (150,0)(0,90)



C) Use your graph to find two different combinations of tickets they can sell to meet their goal.

150 Children's ticket and 0 Adult ticket

Or

90 Adult tickets and 0 children's Tickets

90. Write an equation in slope-intercept form for the line that goes through the points (2, -5) and (0, -7)

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad (2, -5) (0, -7)$$

$$m = \frac{-7 - -5}{0 - 2}$$

$$m = \frac{-7 + 5}{-2}$$

$$m = \frac{-2}{-2}$$

$$m = 1$$

$$m = 1 (0, -7)$$

$$y = mx + b$$

$$y = x - 7$$

91. Write an equation in slope-intercept form for the line that goes through the points (-2, -6) and (8, 4)

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad (-2, -6) (8, 4)$$

$$= \frac{4 - -6}{8 - -2}$$

$$= \frac{4 + 6}{8 + 2}$$

$$= \frac{10}{10}$$

$$= 1$$

$$m = 1 (8, 4)$$

$$y - y_1 = m(x - x_1)$$

$$y - 4 = 1(x - 8)$$

$$y - 4 = x - 8$$

$$+4 = \quad +4$$

$$y = x - 4$$

92. Write an equation for the line that is parallel to $y = 2x - 7$ and goes through $(3, 4)$.

$$m = 2 \quad (3, 4)$$

$$y - y_1 = m(x - x_1)$$

$$y - 4 = 2(x - 3)$$

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

$$+4 = \quad +4$$

$$y = 2x - 2$$

93. Write an equation for the line perpendicular to $y = \frac{1}{6}x + 1$ through $(-1, -4)$

$$m = -6 \quad (-1, -4)$$

$$y - y_1 = m(x - x_1)$$

$$y - -4 = -6(x - -1)$$

$$y + 4 = -6(x + 1)$$

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

$$-4 = \quad -4$$

$$y = -6x - 10$$

94. Are the lines parallel, perpendicular, or neither. Explain:

$$y = 3x - 8 \quad m = 3 \quad (0, -8)$$

$$3x - y = -1$$

$$3x - y = -1$$

$$-3x \quad = -3x$$

$$-y = -3x - 1$$

$$\frac{-y}{-1} = \frac{-3x}{-1} - \frac{1}{-1}$$

$$y = 3x + 1 \quad m = -3$$

the lines are parallel because their slopes are the same and their y intercepts are the same.