

INTEGRATED MATH II SUMMER PACKET

DUE THE FIRST DAY OF SCHOOL

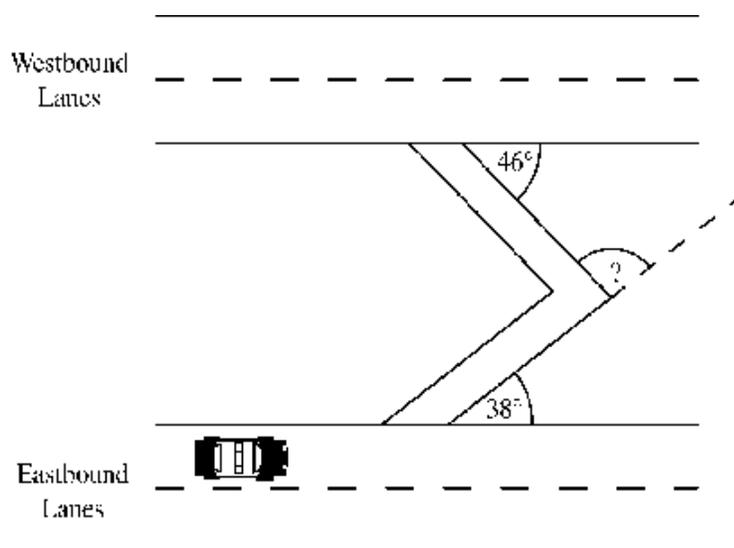
The problems in this packet are designed to help you review topics from previous mathematics courses that are essential to your success in Integrated Math III. **You are expected to bring this completed packet to class on the first day of school.** In addition, this packet will count as part of your first quarter grade. **Upon returning, you will be ASSESSED on the content of this packet.** All contents outlined in the packet are Integrated Math I objectives. Neatly **SHOW YOUR WORK** on a separate sheet of paper.

1. An airplane flies at a rate of 225 mi/h. If the airplane has flown for 5 h, how many miles has it traveled?
2. Find the cost of carpeting an office that measures 15 feet by 18 feet if the carpet costs \$13.50 per square yard.
3. Which of the functions represents the input-output table?

Input	Output
0	3
1	5
2	7
3	9

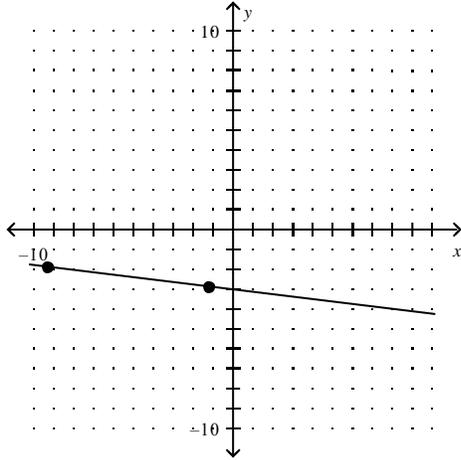
Functions
$y = 2x - 3$
$y = 2x + 3$
$y = 2x - 4$
$y = 3x + 3$

4. A dirt path connects the lanes of a divided highway that runs east-west. An officer in a police car headed east gets a call that requires crossing over to the westbound lanes using the dirt path.



Through what angle must the police car turn at the bend in the dirt path?

5. Find the slope of the line.



6. Tell whether the lines through the given points are *parallel*, *perpendicular*, or *neither*. Explain.

Line 1: $(2, 2)$, $(-4, 5)$

Line 2: $(4, -9)$, $(-6, -4)$

7. Line l passes through the points $(-3, 1)$ and $(2, 5)$. If $j \parallel l$ and $k \perp j$, what is the slope of k ? Explain your reasoning.

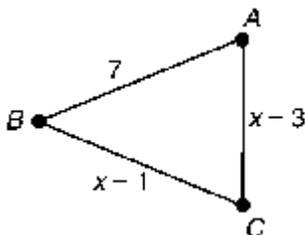
8. During the first 50 minutes of flight, the Concorde climbs from ground level to an altitude of about 52,000 ft. What is the Concorde's rate of change in altitude during this time? Round your answer to the nearest hundred.

9. What is the slope of a line parallel to the line $9x + 3y = 2$?

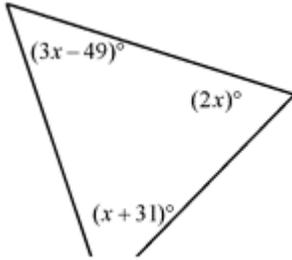
10. Write an equation for the line passing through the point $(-3, -5)$ that has a slope of -5 .

11. Are the lines $y = -\frac{2}{3}x + 2$ and $y = \frac{3}{2}x - 2$ *parallel*, *perpendicular*, or *skew*? Explain your answer.

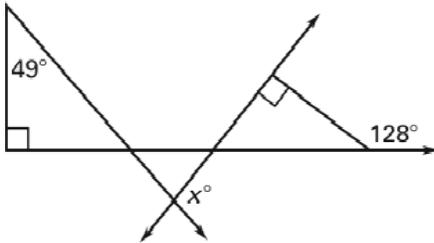
12. Solve for x , given that $\overline{AB} \cong \overline{BC}$. Is $\triangle ABC$ equilateral?



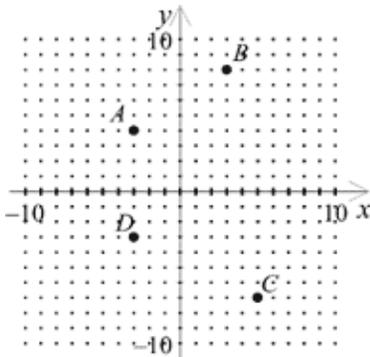
13. Find the measures of all three angles of the triangle.



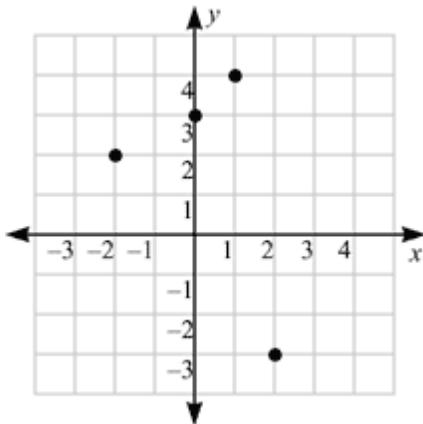
14. Find the measure of $\angle B$.



15. Name the coordinates of the points A , B , C , and D .



16. Write the ordered pairs that are represented by the points in the coordinate plane below.



17. Plot the points $(0, 3)$, $(2, -3)$, $(-3, 1)$, and $(-2, 2)$.

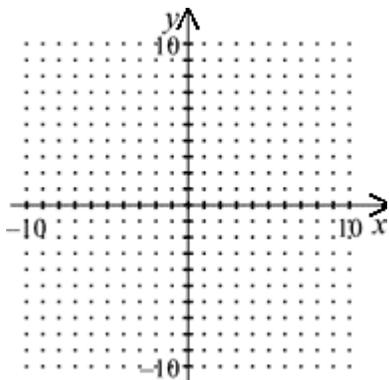
18. Explain how you know the data in the table represent a function. Describe the trend in the data. If you were to graph the data, how many points would lie in Quadrant IV?

x	1	2	3	4	5
y	-7	-2	3	8	13

19. An employee who receives a weekly salary of \$300 and a 4% commission is paid according to the formula $y = 0.04s + 300$, where s represents the total weekly sales. Make a function table to show an employee's weekly salary for weekly sales of \$3,000, \$2,340, and \$4,675.

20. Complete the table and graph the function.

x	-3	-1	0	2	4
$y = \frac{1}{2}x - 4$?	?	?	?	?



Write the table as a set of ordered pairs. Identify the domain and range of the relation.

- 21.

x	y
-8	4
-5	-4
0	3
9	-8

True or False:

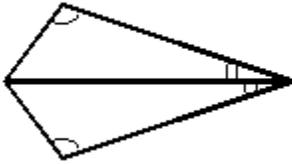
22. **True or False:** The slope of a line is the ratio of *rise* to *run* for any two points on a line.
23. Find the slope of the line passing through the points $A(8, 1)$ and $B(-3, -6)$.

Consider lines whose equations have the form $y = mx + 20$. Find the difference of the x -intercepts of lines l_1 and l_2 if their slopes are m_1 and m_2 , respectively.

24. $m_1 = -\frac{1}{4}, m_2 = \frac{1}{4}$

Would HL, ASA, SAS, AAS, or SSS be used to justify that the pair of triangles is congruent?

25.



Graph the function. Compare the graph with the graph of $f(x) = x$.

26. $g(x) = x - 4$

What is the value of the function when $x = 5$?

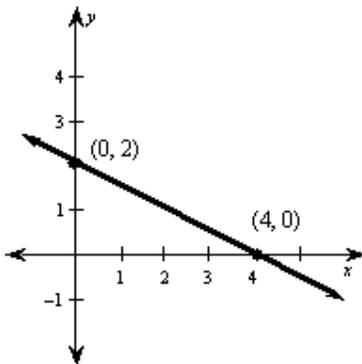
27. $f(x) = -3x$

Find the value of x so that $f(x) = 13$.

28. $f(x) = -\frac{1}{4}x$

29. Write an equation of the line with slope $-\frac{3}{2}$ and y -intercept -5 .

30. Write an equation of the line shown.



31. A sunflower in Julia Rosario's garden was 12 centimeters tall when it was first planted. Since then, it has grown approximately 0.6 centimeters per day. Write an equation expressing the sunflower's height, H , in terms of the number of days, d , since it was planted.

32. An amusement park charges \$9.00 for admission and \$4.00 per ride. Write an equation that gives the cost (in dollars) as a function of number of rides.
33. A music club membership costs \$9.00 and \$10.00 per CD. Write an equation and sketch a graph to describe that relationship.
34. Find the y-intercept of a line that passes through $(-2, 6)$ and has a slope of -5 .
35. Find the y-intercept of a line that passes through $(-6, -1)$ and has a slope of $\frac{5}{7}$.
36. An editor gets a \$2890 raise each year. In her third year, she is making \$47,700 per year. Write an equation that gives her income as a function of how many years she has worked at the company.

Write an equation in point-slope form of the line that passes through the given point and has the given slope m .

37. $(5, -7), m = \frac{3}{5}$

Write an equation in point-slope form of the line that passes through the given points.

38. $(4, -6), (-3, -8)$

Graph the equation.

39. $y + 7 = 3(x + 2)$

40. $y - \frac{3}{2} = 4\left(x + \frac{3}{4}\right)$

41. A revenue of \$1500 is obtained from the sales of item A at \$50 each and item B at \$25 each. Write an equation that shows the relationship between the numbers of items sold.
42. A revenue of \$1800 is obtained from the sales of item A at \$30 each and item B at \$90 each. Write an equation that shows the relationship between the numbers of items sold.

Find the missing coefficient in the equation of the line that passes through the given point. Write the completed equation.

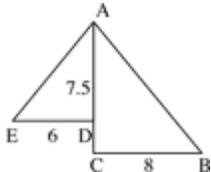
43. $-\frac{1}{9}x + By = 36, (-18, -81)$

Write two equations in standard form that are equivalent to the given equation.

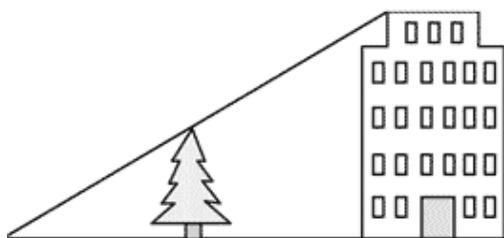
44. $60x - 20y = 48$

45. A photo needs to be enlarged from an original with a length of 7 inches and a width of 5 inches to a size where the new width is 15 inches. What is the new length? What is the scale factor?

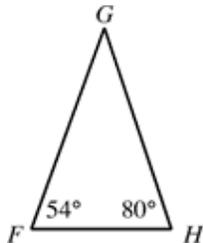
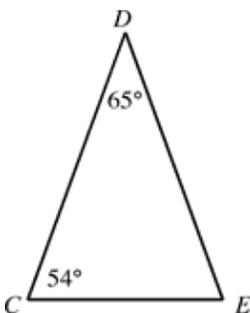
46. $\triangle ABC \sim \triangle AED$ and $AD = 7.5$. What is DC ? Explain how you got your answer.



47. Moody wants to find the height of the tallest building in his city. He stands 422 feet away from the building. There is a tree 40 feet in front of him, which he knows is 22 feet tall. How tall is the building? (Round to the nearest foot.)

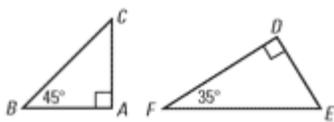


48. True or false: triangle CDE is similar to triangle FGH .



Determine whether the triangles are similar. If they are, write a similarity statement.

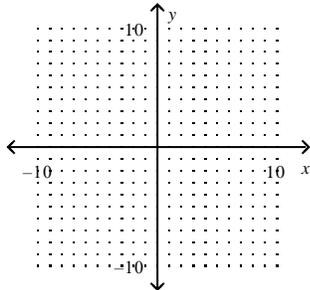
49.



Graph.

50. $y \leq 4x + 4$

51. $3x - 2y > -14$



52. Sketch a graph of the inequality $-2x + 3y > 6$.

53. Solve the linear system by graphing.

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



54. Solve the linear system by graphing.

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



55. The length of a rectangle is 7 cm more than four times the width. If the perimeter of the rectangle is 44 cm, what are its dimensions?
56. The Modern Grocery has cashews that sell for \$4.00 a pound and peanuts that sell for \$2.50 a pound. How much of each must Albert, the grocer, mix to get 60 pounds of mixture that he can sell for \$3.00 per pound? Express the problem as a system of linear equations and solve using the method of your choice.

Solve by elimination:

57. $3x - 4y = 5$
 $5x + 4y = -13$
58. Solve the system.
 $y = -4x + 4$
 $y = -x - 5$
59. Solve the system by adding or subtracting.
 $9x - 7y = -77$
 $-3x - 9y = 3$
60. Solve the linear system by any method.
 $3x - 2y = 3$
 $6x + 2y = 3$
61. Solve the system.
 $2x - 6y = -18$
 $3x + 7y = 37$
62. A total of \$10,000 is invested in two funds paying 5% and 7% annual interest. The combined annual interest is \$630. How much of the \$10,000 is invested in each fund?
63. Find the solution of the system, if it exists.

$$7x - y = 8$$

$$-7x + y = 4$$

64. Find the coordinates of the vertex and determine whether the graph opens *up* or *down*. $y = x^2 - 5$
65. How would you translate the graph of $y = x^2$ to produce the graph of $y = x^2 + 7$?
66. How would the graph of the function $y = x^2 - 3$ be affected if the function were changed to $y = x^2 + 11$?
67. How would the graph of the function $y = x^2 - 17$ be affected if the function were changed to $y = x^2 - 107$?

Graph the function. Compare the graph with the graph of $y = x^2$.

68. $y = x^2 + 8$
69. $y = x^2 - 2$
70. The equation $h = -16t^2 + 40t + 5$ gives the height h , in feet, of a baseball as a function of time t , in seconds, after it is hit. What is the maximum height the baseball reaches?

Tell whether the function has a *minimum value* or a *maximum value*. Then find the minimum or maximum value.

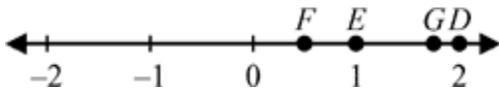
71. $f(x) = -x^2 + 13x - 6$

Solve the equation.

72. $x^2 = 9$
73. $13u^2 + 60 = 45$

Solve the equation. Round the solutions to the nearest hundredth.

74. $5x^2 = 75$
75. D , E , F , and G are four points on the number line below. Which one represents a number that has a square root that is larger than the number itself?



Solve the equation by completing the square.

76. $r^2 - 4r - 7 = 0$

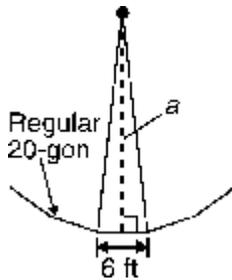
Use the quadratic formula to solve the equation. Round your solution to the nearest hundredth, if necessary.

77. $x^2 - x = 2$

78. $2x^2 - x = 1$

79. Decide whether the three points are the vertices of a right triangle.
(-4, 4), (3, 1), (-2, -1)

80. The base of a gazebo is a regular 20-gon with 6-foot sides. Find its apothem, a , to the nearest tenth of a foot.



81. Suppose you wanted to find out how many students at your school liked watermelon. Identify the sampling method used in the following situation.

You ask 6 freshmen, 6 sophomores, 6 juniors, and 6 seniors chosen at random.

82. **Open-ended Problem:** Describe a real-life situation that the histogram data above might represent.

Simplify the product.

83. $2m^2 \cdot 2^3 m^4$

Simplify the quotient. Write your answer as a power.

84. $\frac{(-4)^{13}}{(-4)^{10}}$

Write the number in scientific notation.

85. 0.000732

86. The ages, in years, of a group of friends are listed.
29, 29, 33, 35, 49, 50, 51, 52

a. Find the mean, median, mode, and range.

b. Which average best represents the data? Explain.

Solve the equation. Then check the solution.

87. $4k - 4(7 + 6k) = 92$

88. $\frac{3x - 2}{5} = 8$

Decide whether the given value is a solution of the equation. If not, find the solution.

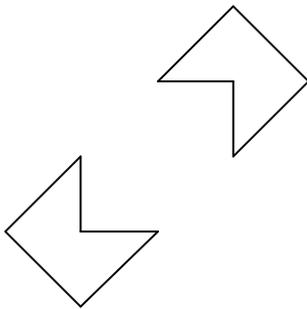
89. $\frac{4y - 2}{6} = 5; y = 8$

90. Lena went to a nursery and bought a bag of potting soil for \$3, 9 plants for \$1 each, and 9 ceramic pots. If she paid a total of \$39, how much did each ceramic pot cost?

Write the rate as a unit rate.

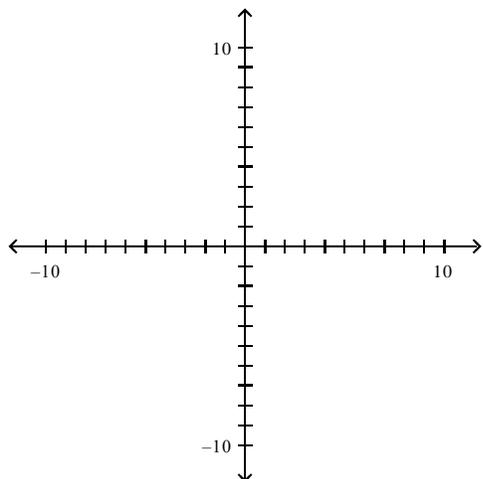
91. $\frac{108 \text{ note cards}}{9 \text{ boxes}}$

92. At 6:44 p.m., a parachutist is 5400 feet above the ground. At 6:52 p.m., the parachutist is 1900 feet above the ground. Find the average rate of change in feet per minute.
93. Does the picture show a reflection?



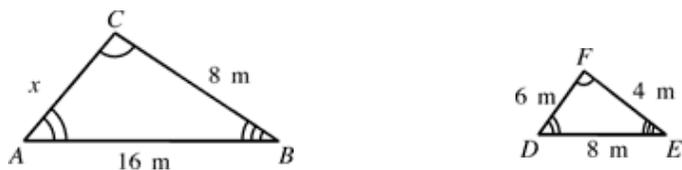
Graph $\triangle DEF$ with vertices $D(0, 3)$, $E(4, 3)$, and $F(0, 7)$. Then graph its image after the given transformation.

94. Rotate 90° counterclockwise 3 times.
95. Graph $\triangle PQR$ with vertices $P(9, -2)$, $Q(8, 7)$, and $R(5, -1)$. Then graph its image after the transformation $(x, y) \rightarrow (x - 12, y - 8)$



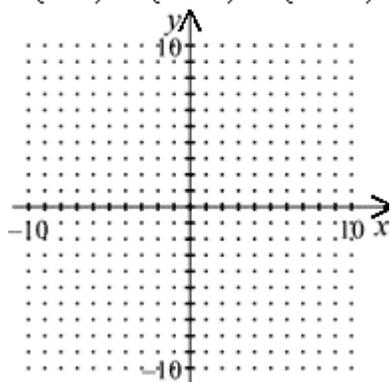
Use the similar polygons to find the value of x . (Figures not drawn to scale.)

96.

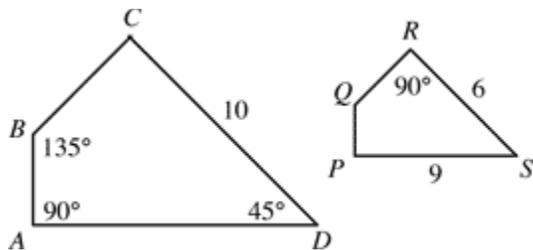


97. Graph $\triangle QRS$. Find the coordinates of its image after a dilation with the given scale factor. Graph the image.

$Q(5, 3)$, $R(-4, 4)$, $S(2, -5)$; scale factor of 2



Use the similar figures $ABCD$ and $PQRS$ to answer the question.



98. a. $\frac{CD}{RS} = \frac{QP}{QP}$

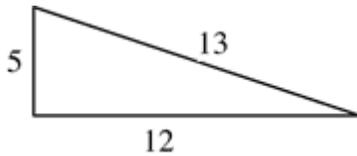
b. Find the measures of $\angle C$ and $\angle S$.

Tell whether the number is *rational* or *irrational*. Explain your reasoning.

99. $\sqrt{13}$

Determine whether the triangle with the given side lengths is a right triangle. Justify your answer.

100.

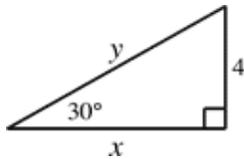


Let a and b represent the lengths of the legs of a right triangle, and let c represent the length of the hypotenuse. Find the unknown length. Then find the area and perimeter.

101. $a = 18.4$ in., $b = ?$, $c = 39.1$ in.

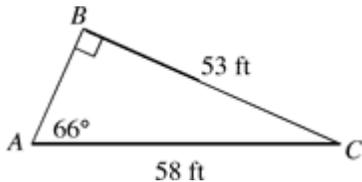
Find the exact value of each variable.

102.



Find the measure of the unknown angle and side. Then write three trigonometric ratios for $\angle A$.

103.

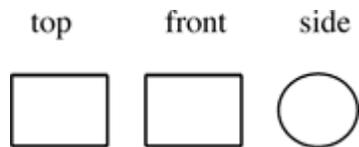


Find the area of the circle with the given radius or diameter. Use 3.14 for π .

104. $r = 23$ ft

Sketch the solid with the given views.

105.



106. Use the steps to draw a pentagonal prism.
- Sketch a pentagon.
 - Sketch a congruent pentagon that is placed behind and to the right of the pentagon in part (a).
 - Connect corresponding vertices to form a prism.

107. Draw a triangular pyramid.

Tell whether the relation is a function. Explain your answer.

- 108.

Input	1	1	3	4
Output	5	2	5	2

109. Complete the table of values for the function rule $y = 2x - 5$.

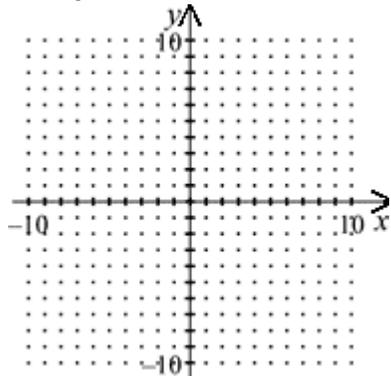
Input x	-1	0	1	2
Output y	?	?	?	?

Change the word sentence into a mathematical equation. Tell what each variable represents.

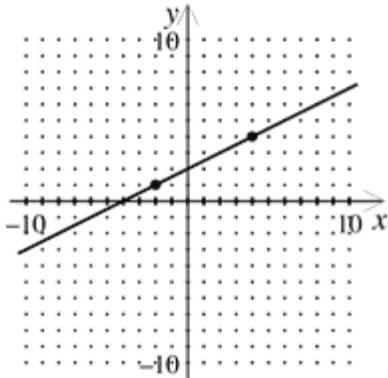
110. The cost of belonging to a fitness club is \$200 to join and \$30 a month in membership dues.
111. Labor charges at an auto repair shop are calculated by multiplying the number of hours spent repairing a car by \$16.
- Write an equation for the cost of labor.
 - How much does the labor cost if it takes $4\frac{1}{2}$ hours to fix a car?
 - How many hours did it take to repair a car if the labor charges are \$20.00?

Graph the linear equation.

112. $4x - 3y = -12$



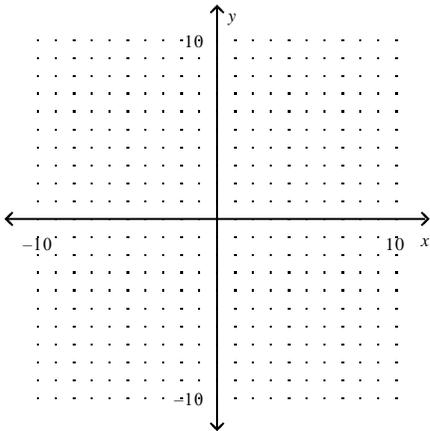
113. Complete the table of values for the line shown in the graph below.



x	1	2	3	4	5
y	?	?	?	?	?

Graph the equation using intercepts.

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



Find the slope of the line passing through the points.

115. $(-6, 8), (6, 3)$

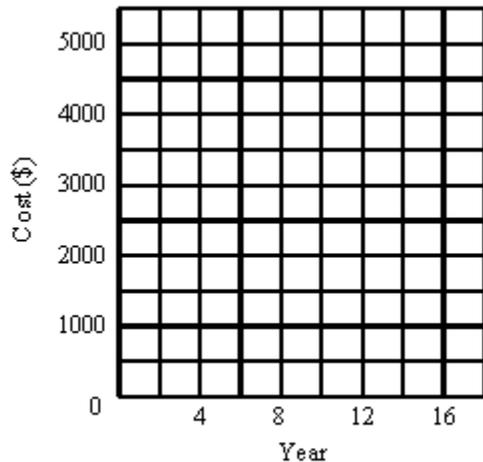
The three points are vertices of a triangle. Find the slope of each side of the triangle.

116. $A(3, 3), B(0, 1), C(-3, 5)$

117. The average cost of a certain computer has decreased since the first year it was marketed. The following table gives the average cost, to the nearest five hundred dollars, in the years since it came on the market.

Year	Average Computer Cost (\$)
4	3500
8	3000
12	2500
16	2000

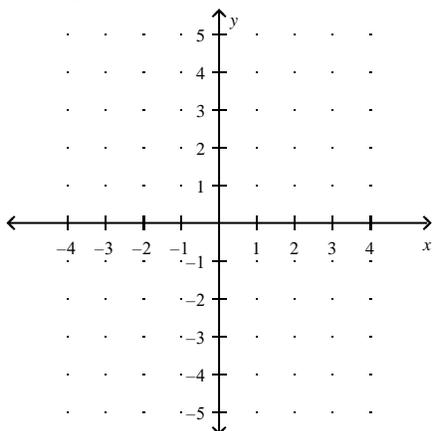
- Plot these points on a graph.
- Graph a line through the points.
- Find the slope of the line.



- On a coordinate grid, graph the points $(3, 2)$ and $(-2, -1)$.
 - Draw a line connecting the points.
 - Find the slope of the line.

Find the slope and y -intercept of the graph of the equation. Then graph the equation.

119. $y = -\frac{1}{9}x + 1$



120. $y = -4x + 1$

Tell whether the point is a solution of the inequality.

121. $3x + 4y \leq -14$; $(2, -5)$

Make a box-and-whisker plot of the data.

122. 32, 26, 26, 36, 24, 26, 24, 29, 31, 30, 31

123. **Performance Task:** A set of quiz grades for two different classes is given in the table below.

Class 1	5	7	10	10	8	7	5	10	8	10
Class 2	8	9	8	6	8	10	8	7	9	7

- Calculate the mean for each class. What does the mean tell you about each class?
- Draw a histogram for each class. What does the histogram tell you about each class?
- Which class do you think would be easier for a teacher to teach? Explain why you think so.
- Why should a teacher be cautious about making assumptions based on the mean of a set of quiz grades?

124. Solve the equation $4x^2 + 7x - 2 = 0$.

Factor the trinomial.

125. $25x^2 - 15x + 2$

126. $2x^2 - 17x + 8$

127. A rectangle with an area of 24 square units has length $x + 1$ and width $4x - 6$. Find the value of x .

128. Graph $y = -\frac{1}{5}x^2$. Give the vertex and the line of symmetry.

129. Graph the functions $f(x) = -2(x + 1)(x - 5)$ and $g(x) = -2(x - 1)(x + 5)$. Compare the two graphs and then write each function in vertex form.

130. The height, h (in feet), of a falling object on Mars is given by $h = -6t^2 + s$, where t is the time in seconds and s is the initial height in feet. If an object were dropped from a height of 237 feet, how long would it take to travel half the distance to the ground? (Round to two decimal places.)