Accelerated Math II Summer Review Packet
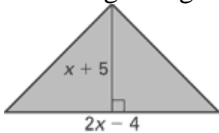## *DUE THE FIRST DAY OF SCHOOL*

The problems in this packet are designed to help you review topics from previous mathematics courses that are essential to your success in Accelerated 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 II objectives. Neatly **SHOW YOUR WORK** on a separate sheet of paper.

1. Can the lengths of 6 mm, 12 mm, 13 mm form a right triangle?

2. Lena made 32 ounces of a fruit drink mix using pineapple juice and grapefruit juice. The number of ounces of pineapple juice in the fruit drink mix is 5 more than 2 times the number of ounces of grapefruit juice in the fruit drink mix. Write a system of equations and a graph that shows the number of ounces pineapple juice, x, and the number of ounces of grapefruit juice, y, in the fruit drink mix.

3. Write $\sqrt[3]{24}$ in the simplest form

4. Simplify $\left(7x^3 - 3x^2 + 5x - 5\right) + \left(5x^2 - 8x - 3\right)$?

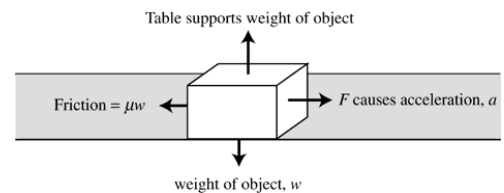5. Write the trinomial that represents the area of the following triangle

6. A triangle's base is 14 inches less than 2 times its height. If h represents the height in inches, and the total area of the triangle is 54 square inches, write the equation that can be used to determine the height

7. Which value is missing in the table?

n	0	4	6
$2(n+3)$	6	14	?

8. Graph $y = \dfrac{2}{5}x + 3$. Then, graph another graph on the same coordinate the result of changing the 3 in the equation to -1?

9. The coefficient of friction, μ, is a ratio that compares the friction acting on a dragged object to its weight, w. The relationships between the mass m and the acceleration a of an object that is being dragged across a flat surface, such as a table top, by a force F, is given by the equation $ma = F - \mu w$.

What formula can you use to find the coefficient of friction?

10. The table below shows the height of a plant over time.
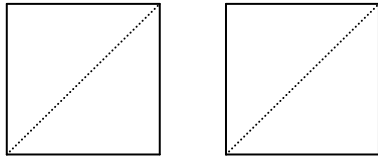
Bamboo Height	
Time (Week)	Height
1	2.25
2	4.63
3	6.00
4	8.63
5	10.25

Draw the scatter plot that shows the relationship between time and the height of the plant.

11. Employees earn $5 per hour plus $0.75 for every unit they produce per hour. Write an equation and draw a graph in which y represents the employee's wages for producing x units per hour, and the graph of the wages earned for producing 2, 5, 8, and 10 units per hour?
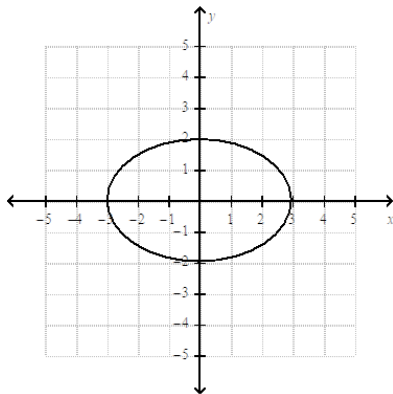
12. One way to calculate the area of a square is to divide the square of the length of a diagonal by 2: $A = \dfrac{d^2}{2}$. What is the total area in square units of the two identical squares below if each diagonal is $\sqrt{5}$ units long?

13. A bag of chips costs $2.33. Your total grocery bill, b, is a function of the number of bags of chips, n, you purchase. Write an equation to represent this function.

14. Determine whether the graph represents a function.

Solve the equation.

15. $8x - 9 = x + 9$

16. Will and Jim shared the driving on a trip to a business convention. Will's average driving speed was 52 miles per hour. Jim averaged 44 miles per hour and drove 2 hours longer than Will. If x is the time Will drove, the situation can be modeled by the equation $44(x + 2) = d - 52x$, where d is the length of the trip in miles. If the trip was 352 miles long, how far did Jim drive?

17. Find the slope and y-intercept of the line with the equation $-9x + 3y = 54$.
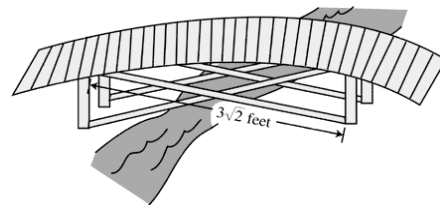
Solve.

18. $13b - 6 \le 14b + 8$

19. The length of a rectangle is 8 cm more than four times the width. If the perimeter of the rectangle is 46 cm, what are the dimensions?

Simplify:

20. $\left(wc^7 \right)\left(-8w^3c^5 \right)$

21. In astronomy, the immense distances between celestial bodies are measured in light-years, the distance that light can travel in one year. One light-year is approximately 5,880,000,000,000 miles. If a star is 8.4 light-years from Earth, how would you correctly represents the number of miles the star is from Earth in scientific notation ?
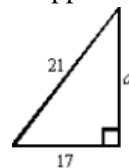
22. A bridge over a stream in a garden is to be braced as shown in the figure below. The contractor determines that each of the identical braces must be $3\sqrt{2}$ feet long.

What is the approximate total length of all 4 braces?

23. State the domain and range of the following relation.
$\{(-1, 4), (0, 4), (1, 4), (2, 4), (3, 4), (4, 4)\}$
Is this relation a function?

24. Find the length of the leg of this right triangle. Give an approximation to 3 decimal places.
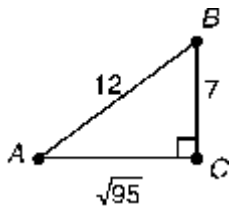

25. How long is a string reaching from the top of a 13-ft pole to a point on the ground that is 7 ft from the base of the pole?
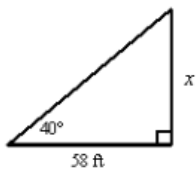
26. The city commission wants to construct a new street that connects Main Street and North Boulevard as shown in the diagram below. The construction cost has been estimated at $110 per linear foot. Find the estimated cost for constructing the street. (1 mile = 5280 ft)
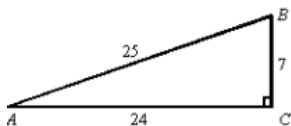

27. The tangent of $\angle B$ is _____.

28. A photographer shines a camera light at a particular painting forming an angle of 40° with the camera platform. If the light is 58 feet from the wall where the painting hangs, how high above the platform is the painting?
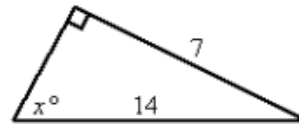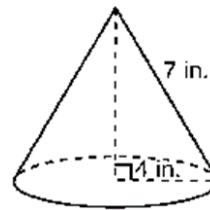

29. Write cos B.

30. To find the height of a tower, a surveyor positions a transit that is 2 meters tall at a spot 95 meters from the base of the tower. She measures the angle of elevation to the top of the tower to be 32°. What is the height of the tower, to the nearest meter?

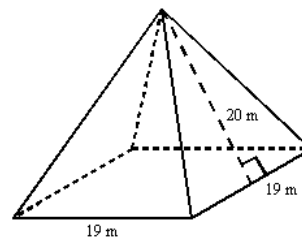31. Solve for x to the nearest degree.

32. The inside of an ice cream cone is filled with ice cream and has radius 6 cm and height 12 cm. Assuming that a half-scoop of ice cream is in the shape of a hemisphere, and that it fits perfectly on top of the cone (same radius), find the total volume of ice cream. Use 3.14 for ▢ and round your answer to the nearest tenth.
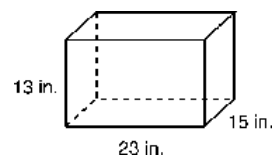
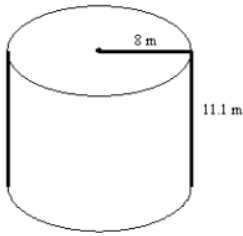33. The surface area of the right cone shown is _____.

34. Find the surface area of this square pyramid if the height of each triangular face is 20 meters and the length of each side of the base is 19 meters.
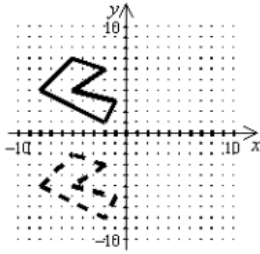

35. If all the angles in the faces of the polyhedron below are right angles, then its surface area is _____.

36. Find the surface area of the cylinder to the nearest square unit. Use $\pi \approx 3.14$.

37. The change in position from the solid figure to the dotted figure is best described as a _____.
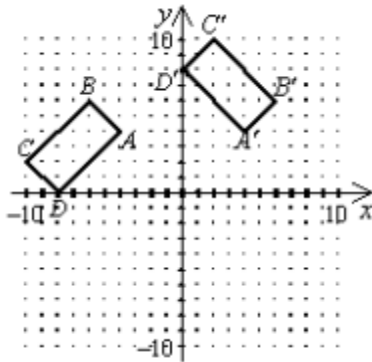

38. Use the graph below to complete the sentence.

Figure $A'B'C'D'$ is the image of figure $ABCD$ under a rotation _____

39. After the introduction of a new soft drink, a taste test is conducted to see how it is being received. Of those who participated, 48 said they preferred the new soft drink, 112 preferred the old soft drink, and 40 could not tell any difference. What is the probability that a person in this survey, chosen at random, preferred the new soft drink?

Find the value:

40. $7!$

41. $_7P_2$

42. $_7C_2$

43. What are the mean, median, and mode(s) of the data?
2, 17, 26, 27, 14, 4, 12, 26, 26, 6

44. So far in geography class, a student's quiz scores are 86%, 84%, 76%, and 72%. What score does the student need on the fifth quiz to have a mean quiz score of 81%? All the quizzes have equal weights.

45. The scores for the 33 participants in a fund-raising golf tournament are represented in the graph below. In which interval is the median score found?

46. Write a list of the data represented by the stem-and-leaf plot below.

```
6 | 0  4  9
7 | 1  6  7
8 | 1  3  6  9
9 | 3  5  8
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47. Draw a box-and-whisker plot of the data. 40, 37, 29, 36, 41, 39, 33

48. Write 0.000732 in scientific notation.

Simplify the expression using positive exponents.

49. $\left(\dfrac{x^3}{y^8}\right)^4$

50. Find the degree of the polynomial $-3x^4 + 2x^3 + 7$.

51. Classify the expression $-9v^9 - 7$ and state its degree.

Find the difference.

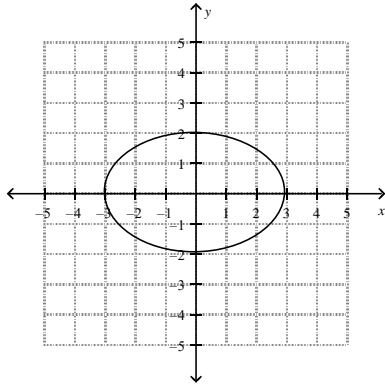52. $\left(6b^3 + 3b^2 + 8\right) - \left(2b^3 - 8b^2 + 6b - 5\right)$

Find the product.

53. $(x + 7)\left(x^2 - 4x + 2\right)$

54. $(5x + 7)(3x - 4)$

55. Graph the parabola: $y = -x^2 + 3x - 1$

56. Determine whether the graph represents a function.

Solve the equation algebraically.

57. $|x - 2| - 2 = 7$
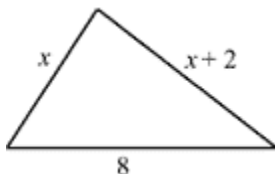
58. Solve the linear system by any method.

$5x - 2y = 3$

$-x + 6y = -2$

Find the product.

59. $(x + 1)\left(x^2 + x + 1\right)$

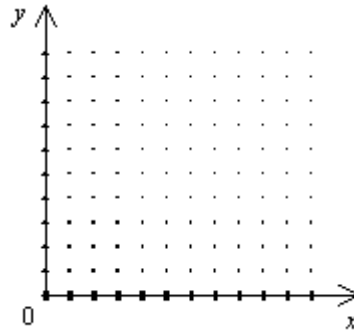60. The triangle below has a perimeter of 23.2. Solve for x.

61. Solve the inequality $-2 < 1 + x \le 2$. Graph your solution.

62. The cost of a taxi ride is given by $C = rd + a$, where r is the rate per one-fifth mile, d is the trip distance in terms of the number of one-fifth-mile units in the trip, and a is the flag-drop fee (an automatic charge created when the meter is started). Solve the equation for the mileage rate r.

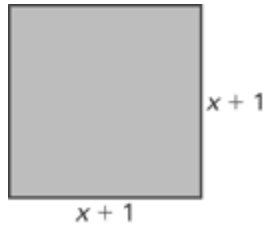63. Rewrite the equation $8x - 3y - 5 = 0$ in slope-intercept form. State the slope and y-intercept.

64. The equation $C = 5x + 770$ can be used to represent a company's cost, in dollars, for producing x cubic yards of bark dust each month. The equation $P = 16x$ can be used to represent the income, in dollars, the company receives when it sells x cubic yards of bark dust. Sketch a graph of the system of equations and find the number of cubic yards of bark dust the company must produce and sell before it begins to show a profit for the month.
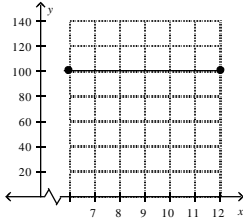

65. Write $\dfrac{2^3}{2^{-3}}$ as a single power of 2.

66. Last year a large trucking company delivered about 5 million loads of goods at an average value of $12,500 per load. What was the total value of goods delivered? Express your answer in scientific notation.

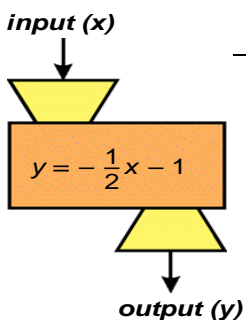67. Write an expression for the area of the figure.

$x + 1$

$x + 1$

68. The radius of the earth is about 6.37×10^6 meters. If a satellite's altitude is 240 kilometers, or 2.40×10^5 meters, above the surface of the earth, what is the satellite's distance from the center of the earth? Give your answer using scientific notation.
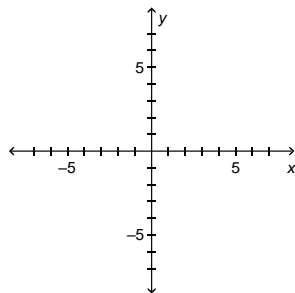
69. What is the range of the function in the graph?

70. The profits of a company are found by subtracting the company's costs from its revenue. If a company's cost can be modeled by $14x + 120,000$ and its revenue can be modeled by $40x - 0.0002x^2$, what is an expression for the profit?

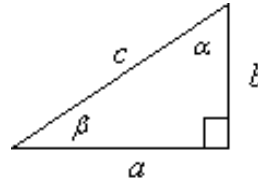71. Refer to the function machine to complete the input-output table and then graph the results.

input (x)

$y = -\frac{1}{2}x - 1$

output (y)

Input (x)	Output (y)
-2	
-1	
0	
1	
2	

Solve the right triangle:

72. $\alpha = 50°$ and $a = 10$; find $\square$, b, and c

73. Find the diameter of a sphere that has a surface area of 169π in^2.

74. The surface area of a sphere is 200 cm^2. If the radius were three times as large, what would the surface area be?

75. The shipping crates shown are similar.
   a. Find the similarity ratio of the crate on the left to the crate on the right.
   b. Find the ratio of their surface areas.
   c. Find the ratio of their volumes.

76. Graph the triangle whose vertices have the coordinates given below. Then draw its reflection in the x-axis.
   (–7, 2), (–2, 2), (–6, 7)

77. Graph the figure with vertices $(5,-2)$, $(7,-4)$, $(4,-7)$, and $(2,-5)$. Rotate the figure 90° counterclockwise about the origin.

   Draw the image of the given figure after a dilation with center O and the given scale factor.

78. scale factor: $\frac{1}{2}$

79. Elaine went to the mall to buy a shirt for a friend. Her choices for the shirt are striped and corduroy. Both of the choices come in green, yellow, and blue. Draw a tree diagram that represents her choices.
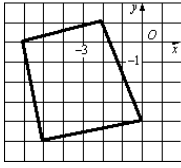
80. If the probability of an event occurring is $\frac{6}{13}$, what are the odds in favor of the event?

81. The probability of an event is $\frac{5}{12}$. Find the odds against the event occurring.

Find the product.

82. $(a-7)^2$

83. Solve the equation $(x-9)(x-7) = 0$.

84. Factor out the greatest common monomial factor from $18u^4v^5 + 30u^5v^4$.

85. Factor out the greatest common monomial factor from $24u^3 + 40u^2$.

86. Solve the equation $30x^2 + 11x - 30 = 0$.

Factor the trinomial.

87. $3x^2 - 19x + 6$

88. $49x^2 - 21x + 2$

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

Solve the equation by graphing.

90. $x^2 - 5x + 4 = 0$

91. You are flying in a plane averaging 450 miles per hour. The distance, d, you travel is a function of the number of hours, h, you travel at that rate. Write an equation to represent this function.

92. The table gives the times spent watching TV and the grades of several students.

Weekly TV (h)	6	12	18	24	30	36
Grade (%)	87.5	82.5	67.5	72.5	57.5	52.5

Display the data on a scatter plot. Put weekly TV on the horizontal axis. Describe any relationship you see.

93. Does the expression $\dfrac{15-(-15)^{-1}}{(-15)^{-4}}$ simplify to a negative number, a positive number, or 0? Explain how this can be determined without actually calculating the value of the expression.

94. A boat travels with the current at a speed of 10 miles per hour with respect to land, then against the same current at a speed of 6 miles per hour with respect to land. Find (a) the speed of the current, and (b) the speed of the boat in still water.

95. A motor boat rental shop on a lake charges a flat fee of $8 for fuel and maintenance, plus $16 per hour. The shop opens at 9:00 A.M. and all boats must be returned by 4:00 P.M. each day. Any time past a whole hour is charged as an additional hour.
Part A The shop owner has drawn a graph of the possible charges, so employees can simply read the rental fee off the graph once the rental time has been determined. The shop owner drew a graph of just 7 points. Why is this enough information?
Part B Draw a graph of the type described in Part A that shows the possible charges for boat rental.

96. In science, work is defined as using a force to move something a distance. The formula for work W (in joules) is $W = F \cdot d$, where F is the force (in newtons) and d is the distance (in meters).

   a. Explain how to solve the formula for force.

   b. Chantelle pushes a box 4.5 meters, doing 144 joules of work. What force does she use to push the box?

   c. Chantelle then pushes the box 9 meters, twice as far as in part (a). She does the same amount of work as in part (a), 144 joules. What force does she use?

   d. In general, if the distance an object is moved is doubled, but the amount of work done does not change, how does the amount of force used change?

97. A bridge has a single lane and is 112 feet long. The weight limit for the bridge is 18 tons. Each car that might be on the bridge is 8.2 feet long and weighs 1.3 tons. Each truck is 15 feet long and weighs 2.5 tons.

   a. Write an inequality you could use to find the number of trucks t that can fit on the bridge when there are 10 cars in the bridge.

   b. Solve the inequality from part (a) to find the number of trucks that can fit on the bridge. Will the weight limit be exceeded? Explain.

98. Madison solved the following equation: $\frac{2}{5}(2x - 5) = 6$. As a first step, she rewrote the equation as $2x - 5 = 15$.

   a. By what number did Madison multiply both sides of the equation? Why did she choose this number?

   b. What is the solution of the equation?

   c. Christopher solves the same equation. Instead of multiplying by a reciprocal, he chooses to write the problem as $\frac{2(2x - 5)}{5} = 6$. He then multiplies both sides of the equation by 5, then divides both sides by 2. Explain why Christopher's method works.

99. a. What is the difference between a permutation problem and a combination problem?

   b. Describe two situations that could be counted using permutations.

   c. Describe two situations that could be counted using combinations.

100. **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

   a. Calculate the mean for each class. What does the mean tell you about each class?

   b. Draw a histogram for each class. What does the histogram tell you about each class?

   c. Which class do you think would be easier for a teacher to teach? Explain why you think so.

   d. Why should a teacher be cautious about making assumptions based on the mean of a set of quiz grades