

1. Claire paid \$12.50 less for a book than she paid for a video. Altogether she paid \$47.50 for both. What was the cost of the video, in dollars? 1. _____ (dollars)
2. Two similar right triangles have areas of 6 square units and 54 square units. The length of the hypotenuse of the smaller triangle is 5 units. What is the length, in units, of the hypotenuse of the larger triangle? 2. _____ (units)
3. A die in the shape of a regular octahedron has its eight faces numbered 1, 2, 3, 4, 5, 6, 7, 8. The sum of any two opposite faces is the same. What number is on the face opposite the face numbered 3? 3. _____
4. What is the area, in square units, of a regular hexagon inscribed in a circle whose area is 324π square units? Express your answer in simplest radical form. 4. _____ (sq units)
5. If $\frac{2}{5} = \frac{A}{60} = \frac{60}{B}$, what is $A + B$? 5. _____
6. Three letters are randomly selected without replacement, one at a time, from $\{A, B, C, \dots, Z\}$. What is the probability they are selected in alphabetical order? Express your answer as a common fraction. 6. _____
7. What speed, measured in kilometers per hour, is equivalent to 5000 cm per minute? 7. _____ (kph)
8. From his base camp at the equator, Bruce hiked on flat terrain 13 kilometers due north, then 24 km due east, and finally 6 km due south. Using a direct route, how many kilometers would Bruce be from base camp? 8. _____ (kilometers)
9. What is 50% more than twice the sum of 12 and 18? 9. _____
10. What is the product of the least common multiple and the greatest common factor of 20 and 90? 10. _____
11. The midpoints of the sides of a triangle with area T are joined to form a triangle with area M . What is the ratio of M to T ? Express your answer as a common fraction. 11. _____
12. If 81 is the sum of three numbers that are in the ratio of 6:2:1, what is the smallest of these three numbers? 12. _____

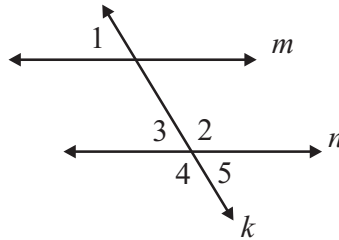
13. A jar contains over 40 marbles. Each marble is red, white or blue. If $\frac{3}{7}$ of the marbles are red and $\frac{2}{7}$ of the marbles are white, what is the smallest possible number of blue marbles in the jar?

13. _____ (blue marbles)

14. An open box with a square base and a volume of 162 cubic cm is to be made by cutting a square with side length 2 cm from each corner of a rectangular piece of cardboard and turning up the sides. What is the area, in square cm, of the rectangular piece of cardboard that is needed?

14. _____ (sq cm)

15. Line m is parallel to line n and the measure of $\angle 1$ is $\frac{1}{8}$ the measure of $\angle 2$. What is the degree measure of $\angle 5$?



15. _____ (degrees)

16. Each term of the sequence 3, 10, 17, 24, . . . is seven more than the term that precedes it. What is the integer value of the first term of the sequence that is greater than 2000?

16. _____

17. A box contains 8 marbles that are either red, green, or white. There is at least one marble of each color. Exactly one-fourth of the red marbles and exactly one-third of the green marbles are removed and are replaced with white marbles. How many white marbles are now in the box?

17. _____ (white marbles)

18. What is the smallest possible area, in square units, of a right triangle with two sides measuring 4 units and 5 units?

18. _____ (sq units)

19. If $a = 8$, what is the value of $(16\sqrt[3]{a^2})^{\frac{1}{3}}$?

19. _____

20. Angie mixed two types of nuts that cost \$3.80 per pound and \$5.20 per pound. If her 28-pound mixture cost \$4.20 per pound, how many pounds of the more expensive nuts did she use?

20. _____ (pounds)

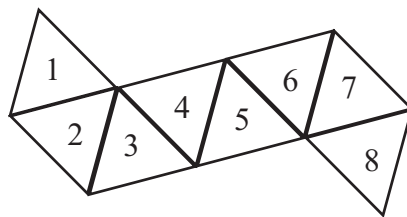
21. The sum of eight one-digit positive integers is 44. If seven of the numbers are equal, what is the sum of the possible values for the eighth integer?

21. _____

22. A rectangle is twice as long as it is wide. The numerical value of its area, in square centimeters, is triple the numerical value of its perimeter, in centimeters. What is the perimeter of the rectangle, in centimeters?

22. _____ (centimeters)

23. A dump truck delivered sand to a construction site. The sand formed a conical pile with a diameter of 8 feet and a height that was 75% of the diameter. How many cubic feet of sand were in the pile? Express your answer in terms of π . 23. _____ (cu feet)
24. How many points whose coordinates are both positive integers are on the line that runs through the points (0, 12) and (20, 0)? 24. _____ (points)
25. The sum of the digits of a two-digit integer is 12. The value of the integer is 13 times the tens digit. What is the integer? 25. _____
26. If A is 25% larger than B and B is 50% larger than C, what is the ratio of C to A? Express your answer as a common fraction. 26. _____
27. What is the equation with the smallest positive integer coefficients of the line passing through the point (3, -7) and perpendicular to the line $4x - 5y = 3$? Express your answer in the form $Ax + By = C$, where A and B are the smallest possible positive integers. 27. _____
28. If a haystack in the shape of a right circular cone has a base radius of 5 meters and contains 12 tons of hay, what will be the number of tons of hay in a similar conical haystack whose base diameter is 15 meters? Two right cones are similar if their heights and their base radii are in proportion. Express your answer as a decimal to the nearest tenth. 28. _____ (tons)
29. The geometric mean of A and B is defined as $\sqrt{A \cdot B}$. What is the positive geometric mean of 9 and $11\frac{1}{9}$? 29. _____
30. John's algebra teacher was born in the year "19AB." In the year 2010, his teacher will turn "AB" years old; where again A is the tens digit and B is the ones digit. In what year was his teacher born? 30. _____
31. If n is any positive two-digit integer, what is the greatest positive integer that must be a factor of $n(n+1)(n+2)(n+3)$? 31. _____
32. A regular octahedron is folded from the net shown. What number shows on the top when the face numbered 1 is on the bottom? 32. _____
33. How many non-congruent triangles can be drawn if each triangle has a side 12 units long, a side 13 units long and a right angle? 33. _____ (triangles)



34. In how many different ways can 6 be written as the sum of three positive integers if the order of the different addends is significant? 34. _____ (ways)
35. If a central angle of 90 degrees defines an arc on circle R that has the same length as the arc on circle W defined by a 60-degree central angle, what is the ratio of the area of circle R to the area of circle W? Express your answer as a common fraction. 35. _____
36. What is the greatest common factor of all four-digit palindromes? 36. _____
37. The line $5x + 6y = 27$ passes through a point whose coordinates are both positive integers. What are the coordinates of this point expressed as (x, y) ? 37. _____ (,)
38. The lateral (curved) surface area of a particular right circular cylinder ($2\pi rh$), in square units, is numerically equal to its volume ($\pi r^2 h$), in cubic units. What is the radius of the cylinder, in units? 38. _____ (units)
39. A chord of length 6 units divides a circle into two distinct areas. If the circle has a radius of 6 units, what is the area of the larger region, in square units? Express your answer in simplest radical form in terms of π . 39. _____ (sq units)
40. A pair of standard, six-sided dice is rolled three times. What is the probability that exactly one of these rolls yields a sum of 7? Express your answer as a common fraction. 40. _____
41. If $9^{x-3} = 729$, what is the value of x ? 41. _____
42. The ratio of two interior angles of a parallelogram is 4:5. What is the degree measure of one of the two obtuse angles of the parallelogram? 42. _____ (degrees)
43. The graphs of $y = x^2 - 7x + 7$ and the line $y = -3$ intersect at two points. What is the sum of the x -coordinates of these two points? 43. _____
44. Three fair six-sided dice are rolled. What is the probability that at least one of the three numbers rolled is greater than or equal to 3? Express your answer as a common fraction. 44. _____
45. What percent of $3\frac{1}{3}$ is $1\frac{1}{3}$? 45. _____ (percent)

46. What is the area, in square units, of a triangle with vertices at $A(1, 1)$, $B(6, 1)$, $C(3, 7)$? 46. _____ (square units)
47. The terms of an increasing arithmetic sequence have a common difference of 2. If the sum of three consecutive terms is 36, what is the sum of the next three consecutive terms? 47. _____
48. How many positive perfect square integers are factors of $(2^{10})(3^{12})(5^{15})$? 48. _____ (integers)
49. A mixture of green paint contains 3 pints of blue paint and 1 pint of yellow paint. A mixture of orange paint contains 2 pints of red paint and 2 pints of yellow paint. If all of both paint mixtures are combined, what fraction of the resulting mixture was once yellow paint? Express your answer as a common fraction. 49. _____
50. In an election for town clerk, there were two candidates. A total of 458 people voted exactly once for one candidate or the other. The winner got 122 more votes than the loser. How many people voted for the winning candidate? 50. _____ (people)
51. If $\overline{0.4818181}$ is written as a fraction in lowest terms, how much greater is the denominator than the numerator? 51. _____
52. If $uv = 6$, what is the value of $(u + v)^2 - (u - v)^2$? 52. _____
53. A right triangle with legs 10 and 8 is similar to another right triangle with legs x and 5, respectively. What is the value of x ? Express your answer as a decimal to the nearest hundredth. 53. _____
54. What is the units digit of the sum $1 + 2 + 3 + \dots + 2009 + 2010$? 54. _____
55. What is the area, in square units, of the square with the four vertices at $(-2, 2)$, $(2, -2)$, $(-2, -6)$, and $(-6, -2)$? 55. _____ (square units)
56. If y varies directly with the square of x and x varies directly with the cube of z , by what factor is y multiplied when z is doubled? 56. _____
57. Six positive integers from a list of nine positive integers are 6, 7, 2, 4, 8, 5. What is the largest possible value of the median of this list of nine positive integers? 57. _____
58. What is the smallest possible positive difference between two four-digit palindromes? 58. _____

59. Circle B has its center at $(-6, 2)$ and a radius of 10 units. What is the sum of the y -coordinates of the two points on circle B that are also on the y -axis? 59. _____
60. A rhombus has a perimeter of 68 units and one of its diagonals is 30 units. What is its area in square units? 60. _____ (square units)
61. Ann has 30% less money than Mary, and Jessica has 70% more money than Mary. If the three of them have a total of \$102, how much money does Mary have? 61. _____ (dollars)
62. A grocer blends coffee beans from Columbia, Kona and Madagascar in the ratio 2:3:4, respectively. In a 207-kilogram blend, how many kilograms of Madagascar coffee beans are there? 62. _____ (kilograms)
63. A set of 7 distinct positive integers has a mean of 10, a median of 9, and no term larger than 15. What is the minimum possible value of any term in the set? 63. _____
64. Maria is selling apples for 25 cents per apple or \$2.70 for a dozen. What percent discount is she giving for buying by the dozen? 64. _____ (percent)
65. For how many three-digit positive integers is the sum of the digits equal to 4? 65. _____ (integers)
66. The diagonals of a rhombus are 10 inches and 24 inches. What is the perimeter of the rhombus, in inches? 66. _____ (inches)
67. Mary takes two marbles, without replacement, from a bag that contains 10 red and 5 white marbles. What is the probability that both marbles are the same color? Express your answer as a common fraction. 67. _____
68. The product of three positive integers is 60. What is the smallest possible value for the sum of these three positive integers? 68. _____
69. If five is added to the numerator of a fraction, the resulting fraction equals $1\frac{1}{2}$. If 1 is added to the numerator of the original fraction, the resulting fraction is equal to 1. What is the original fraction? Express your answer as a common fraction. 69. _____
70. If $8^r = 32^{12}$, what whole number is equal to $4^r \div 8^{10}$? Express your answer as an integer. 70. _____

71. Laura will have seven test scores at the end of the semester. Each of the scores is a positive integer less than or equal to 100. Her first five scores are 80, 83, 87, 94 and 96. How many different values are possible for the median of her seven scores? 71. _____ (values)
72. Rod counted the bills in his wallet, but he reversed the number of \$5 bills and \$1 bills. The correct total was \$16 more than the incorrect total. If there were three \$1 bills, how many \$5 bills did Rod have? 72. _____ (five-dollar bills)
73. The product of three consecutive odd integers is 4845. What is the largest of these three integers? 73. _____
74. Pat the Printer is in charge of numbering the pages of a book. He has plenty of all the digits 1 through 9, but only has 100 zeroes to work with. If Pat starts with 1, numbers every page and doesn't skip any numbers, on what page will Pat use the last zero? 74. _____ (page)
75. A bottle of vanilla contains 18 tablespoons when completely full. A recipe calls for $1\frac{1}{4}$ tablespoons of vanilla. How many tablespoons will be left in the bottle after making a triple batch? Express your answer as a mixed number. 75. _____ (tablespoons)
76. There are 24 four-digit positive integers that can be formed using each of the digits 2, 3, 7, 9 exactly once. How many of these 24 integers are prime? 76. _____ (integers)
77. If x is an integer, what is the smallest value of the expression $x^2 - 6x + 13$? 77. _____
78. What is the number of square meters in the area of a circle with diameter 6 meters? Express your answer in terms of π . 78. _____ (square meters)
79. How many integers k satisfy the equation $k^2 \leq 11$? 79. _____ (integers)
80. What is the greatest integer less than $\frac{19}{3}$? 80. _____