
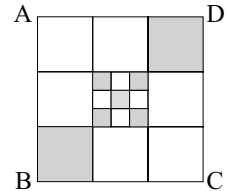


1. \_\_\_\_\_ What is the reciprocal of the sum of the reciprocals of 4 and 5? Express your answer as a common fraction.
2. \_\_\_\_\_ If  $\frac{x}{y} = 1$ , then what is the value of  $x - y$ ?
3. \_\_\_\_\_ If Mary's first three test scores are 95, 88 and 100, what score must she make on the next test to have a test average of 90?
4. \_\_\_\_\_ (minutes) Luther began reading a 200-page book at 1:15 pm, and he had read 40 pages by 2:00 pm. If he continues to read at the same rate, how many minutes will it take him to read the remainder of the book?
5. \_\_\_\_\_ (degrees) The smallest angle of a triangle measures  $18^\circ$ . What would the degree measure of the smallest angle of the triangle be if the length of each side were doubled?
6. \_\_\_\_\_ (%) If Lex slices a pie into ten congruent pieces and then eats three pieces, what percent of the pie is left?
7. \_\_\_\_\_ (integers) How many different positive three-digit integers can be formed if the three digits 3, 4 and 5 must be used in each of the integers?
8. \_\_\_\_\_ (%)  Fifteen unit squares are arranged in a 5 by 3 rectangle as shown. What percent of the largest rectangle is shaded gray?
9. \_\_\_\_\_ What number multiplied by 7 is equal to one more than itself? Express your answer as a common fraction.
10. \_\_\_\_\_ If  $a - s - c = -t - b$  and  $s = t$ , what is the value of  $a + b$ ? Express your answer in terms of  $c$ .
11. \_\_\_\_\_ (minutes) Jon ran three laps around the school track. He completed the first lap in 5 minutes. The second lap took 20% longer to complete than the first lap, and the third lap took 30% longer to complete than the second lap. In minutes, what was John's total running time for the three laps? Express your answer as a decimal to the nearest tenth.

12. \_\_\_\_\_ Mary chooses an integer at random from 1 to 6, inclusive. What is the probability that the integer she chooses is a prime number? Express your answer as a common fraction.

13. \_\_\_\_\_ (degrees) What is the positive difference between the number of degrees in the smaller angle formed by the hour and minute hands of a clock at 1 p.m. and the smaller angle formed by the hour and minute hands at 4 p.m.?

14. \_\_\_\_\_ Square ABCD is partitioned into nine congruent squares, with the center square partitioned again into nine congruent squares. What fractional part of square ABCD, shown here, is gray? Express your answer as a common fraction.



15. \_\_\_\_\_ Point  $(k, -3)$  lies on the line whose equation is  $x - 2y = -2$ . What is the value of  $k$ ?

16. \_\_\_\_\_ What is the slope of the line  $2y = 3x + 2$ ? Express your answer as a common fraction.

17. \_\_\_\_\_ (degrees) What is the number of degrees the minute hand of a clock moves between 6:04 p.m. and 6:21 p.m.?

18. \_\_\_\_\_ In the set  $\{2, 5, 11, 17, 20\}$  what is the difference between the mean and the median?

19. \_\_\_\_\_ (%) Mrs. Nguyen sold her old car to a collector for 150% more than its original price of \$6400. What percent of the selling price is the original price?

20. \_\_\_\_\_ (dollars) Josh bought a house for \$150,000 and then sold it for \$190,000. He later bought back the house for \$230,000 and then a few years later sold it for \$275,000. In dollars, what was Josh's total profit for these two transactions?

21. \_\_\_\_\_ (paper clips) A pencil and five paper clips weigh the same as two erasers. A pencil weighs the same as 29 paper clips. How many paper clips weigh the same as an eraser?

22. \_\_\_\_\_ (%) If on a certain day there were only 28 of 35 students present for gym class, what percent of the students were absent?

23. \_\_\_\_\_ (units) The measure of the area of a trapezoid is numerically equal to eight times the sum of the lengths of its two bases. What is the height of the trapezoid, in units?

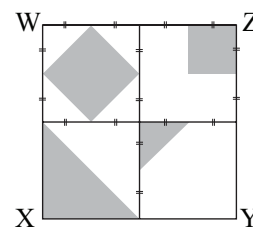
24. \_\_\_\_\_ If  $n = \sqrt{25}$ , what is greatest value of  $25n$ ?

25. \_\_\_\_\_ (mi/h) For the first half of a bicycle trip, Vince rode downhill at 24 miles per hour for 2 hours. During the second half of the trip, he rode uphill at half his downhill speed for twice as long before returning to his starting point. What was Vince's average speed, in miles per hour, for the entire trip?

26. \_\_\_\_\_ (yd) A wire of uniform diameter and composition that weighs 32 lb is cut into two pieces. One piece is 90 yd long and weighs 24 lb. What is the length, in yards, of the original wire?

27. \_\_\_\_\_ (rubber bands) Mr. Reynault bought a bag of 300 rubber bands for a class project. He has 17 students, and each student is to receive the same number of rubber bands. What is the maximum number of rubber bands each student can receive?

28. \_\_\_\_\_ Square WXYZ is partitioned into four smaller congruent squares, and then portions of those squares are gray, as shown. All segments in the figure marked with double-hash marks are congruent. What fractional part of square WXYZ is gray? Express your answer as a common fraction.



29. \_\_\_\_\_ If a fair coin is tossed three times, what is the probability that heads shows once and tails shows twice? Express your answer as a common fraction.

30. \_\_\_\_\_ (stools) The Seat Shop makes 3-legged stools and 4-legged chairs, and each requires one seat. One day they used 6 seats and 20 legs. How many stools did they make?

31. \_\_\_\_\_ A model of a building is constructed such that the ratio of the dimensions of the model to the dimensions of the building is 1:9. What is the ratio of the volume of the model to the volume of the building? Express your answer as a common fraction.

32. \_\_\_\_\_ A new rectangle is created by increasing the length and width of the original rectangle by two units each. The numerical value of the area of the new rectangle is equal to  $k$  more than the sum of the numerical values of the original rectangle's area and perimeter. What is the value of  $k$ ?

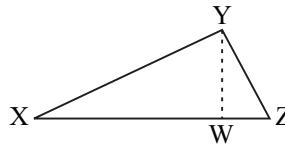
33. \_\_\_\_\_ (points) Becca scored 10, 10, 15, 15, 20, 20, 20 and 20 points in her first eight games. How many points must Becca score in her ninth game so that the mean, median and mode of her nine point totals each have the same value?

34. \_\_\_\_\_ (people) When a choir is arranged in rows of five people each, the last row is one person short. When a choir is arranged in rows of six people each, the last row is still short one person. What is the least possible number of people in the choir?

35. \_\_\_\_\_ What is the value of  $29 \times 31 + 19 \times 21$ ?

36. \_\_\_\_\_ What is the maximum possible product of two integers whose sum is 30?

37. \_\_\_\_\_ (cm) In  $\triangle XYZ$ ,  $XY = 17$  cm,  $XW = 15$  cm and  $YZ = 10$  cm. What is the length of altitude  $YW$ , in centimeters?



38. \_\_\_\_\_ (ways) In how many ways can two standard six-sided dice, one red and one white, be rolled to yield a sum that is a prime number?

39. \_\_\_\_\_ (dollars) Berni has 29 coins in nickels and quarters. She has seven more quarters than nickels. What is the value of Berni's collection of coins, in dollars? Express your answer as a decimal to the nearest hundredth.

40. \_\_\_\_\_ What is the arithmetic mean of  $1^2$ ,  $2^2$ ,  $3^2$ ,  $4^2$  and  $5^2$ ?

41. \_\_\_\_\_ (dollars) An anonymous donor gave a bag containing \$912,000 to the Central Middle School MATHCOUNTS team, with instructions that the money be divided evenly among the 19 team members. In dollars, how much will each team member receive?

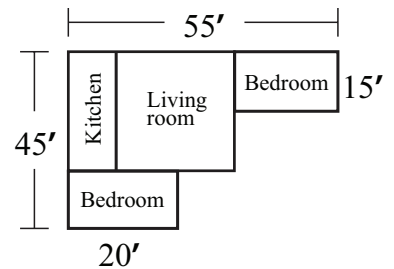
42. \_\_\_\_\_ (in) The perimeter of a particular rectangle is eight times its width. If the area of the rectangle is  $243 \text{ in}^2$ , what is the width of the rectangle, in inches?

43. \_\_\_\_\_ (combinations) A bag contains marbles of three different colors with at least three marbles of each color. Three marbles are randomly selected, without replacement. How many different color combinations are possible? (Note: “red, red, blue” and “red, blue, red” are the same combination.)

44. \_\_\_\_\_ (units) What is the distance, in units, between the points  $(-5, 5)$  and  $(3, -10)$ ?

45. \_\_\_\_\_ What is the value of  $3 \cdot 3 + 3(3 + 3) - 3^3$ ?

46. \_\_\_\_\_ ( $\text{ft}^2$ ) The complete floor plan of a vacation cottage is shown. Both bedrooms have the same dimensions. What is the total area of the cottage, in square feet?

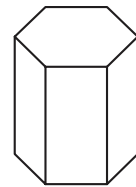


47. \_\_\_\_\_ (hours) If 45 cards can be copied in 30 minutes, how many hours will it take to copy 540 cards, at the same rate?

48. \_\_\_\_\_ Five boogats plus a zignot is 87. A boogat plus five zignots is 99. What is the sum of two boogats and two zignots?

49. \_\_\_\_\_ (in) In inches, what is the length of the hypotenuse of a right triangle whose legs measure 25 in and 60 in?

50. \_\_\_\_\_ (edges) What is the number of edges in a regular hexagonal prism?



51. \_\_\_\_\_ What is the simplified form of  $\frac{\frac{5}{6} - \frac{1}{3}}{\frac{1}{8}}$ ?

52. \_\_\_\_\_ What integer can be added to  $\frac{13}{12}$  or multiplied by  $\frac{13}{12}$  to give the same result?

53. \_\_\_\_\_ What is the value of  $x$  if  $x:12 = 25:5$ ?

54. \_\_\_\_\_ (ways) The chess club has six members. For the next meet, the coach can take a team with only five members. In how many ways can the coach choose the team for the next meet?
55. \_\_\_\_\_ What is the slope of the line that passes through (2, 3) and (4, 2)? Express your answer as a common fraction.
56. \_\_\_\_\_ If one-half of a number is eight less than two-thirds of the number, what is the value of the number?
57. \_\_\_\_\_ What is the least possible sum of two positive integers whose product is 182?
58. \_\_\_\_\_ What is the smallest odd integer with exactly six positive factors?
59. \_\_\_\_\_ (tiles) What is the minimum number of square tiles needed to exactly cover a rectangle whose length is 50% greater than its width?
60. \_\_\_\_\_ (chords) Eight distinct points are drawn on the circumference of a circle. What is the total number of chords that can be drawn connecting any two of these points?