
MATHCOUNTS

■ Speed and Accuracy Practice Test 9 ■

Name

Date

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

The test consists of two parts, with each part 40 problems. You will have 15 minutes to complete the part 1 and 25 minutes to complete the part 2. You are not allowed to use calculators, books, or any other aids during this round. Calculations may be done on scratch paper. All answers must be complete, legible, and simplified to lowest terms. Record only final answers. Do each problem as quick as you can. If you finish one problem, go to the next. Do not spend any time to check your answers.

Total Correct		Scorer's Initials
Part I		
Part II		

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Part I Problems 1–40

1. $192 + 59 + 18 =$

2. $17^2 =$

3. $101 \times 21 =$

4. $20.46 - 3.76 =$

5. $20 - 4^3 \div 8 =$

6. $\frac{1}{2}$ of $(\frac{1}{2} + 1\frac{1}{2}) =$

7. Write 6.1% as a decimal.

8. Write $\frac{1}{5} \times \frac{6}{7} \times \frac{7}{8}$ as a percent.9. If $.0000043 = 4.3 \times 10^n$, then $n =$

10. $\sqrt{(-1-3)^2 + (-2-1)^2} =$

11. 19 weeks = _____ days

12. The mean of 133, 134, 135, 136, 137, 138, 139 =

13. $4\frac{5}{17} \times 17 =$

14. $7! =$

15. If 5 cookies cost \$4.45, then one cookie costs _____ ¢

16. If $\frac{4}{5} = \frac{2x}{5}$, then $x =$

17. If $a = 40$, $b = -5$ and $c = 2$, then

$$\frac{a}{b} \div c =$$

18. Express 60 miles per hour as ft per second.

19. Express $\frac{\pi \cdot 7^2 - \pi \cdot 1^2}{\pi \cdot 10^2}$ as a simplest fraction.20. Write $9\frac{1}{5} \times 9\frac{4}{5}$ as a mixed number.21. The complement of an 79° angle is _____ $^\circ$ 22. Simply $\frac{\frac{5}{5} - 4}{\frac{5}{2}}$.

23. The largest palindrome smaller than 1438 is

24. If $x = 2$ and $y = 5$, find the value of $3x - y$.

25. $3 + 6 + 9 + 12 + 15 + 18 + 21 =$

26. $7^2 + 24^2 =$

27. If $x^2 = 15$ and $x < 0$, then $x =$

28. $12\text{ft} \times 5\text{ft} \times 9\text{ft} = \text{--- yds}^3$

29. The 3rd triangular number is

30. If $f(x) = (x - 17)^3$, the $f(12) =$

31. Calculate

$$\pi(2\sqrt{2})^2 - \frac{1}{2} \cdot 2\sqrt{2} \cdot 2\sqrt{2} - \frac{1}{2} \cdot 2 \cdot 2 =$$

32. Compute: $\frac{20 + 4 + 12}{\frac{45}{60} + \frac{47}{60} + \frac{58}{60}}$. Express

the answer as a simplified fraction.

33. If $(2x + 7)(x - 10) = 2x^2 + ax - 70$, then $a =$

34. Find x if $17 + x + 2x + 4x + 5x = 53$.

35. The volume of a cube with edge $\sqrt{2}$ is

36. Simplify $\frac{72}{380} + \frac{2}{380}$

37. The difference between the supplement and the complement of a 49° angle is ---°

38. $6^4 =$

39. The slope of the line passing through $(0,7)$ and $(7,1)$ is

40. $86_9 - 58_9 = \text{---}$

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Part II Problems 41–80

41. Solve for n : $(2^{2n} \cdot 5^2)^2 = 10,000$
42. Find the sum of the following numbers. Express your answer to the nearest thousandth: $\sqrt{2}$, π , e , 1.414, 3.142, 2.718.
43. How many solutions does the equation $\sqrt{5x} = x\sqrt{5}$ have?
44. If $n \times 6! = 7!$, then what is value of n ?
45. If $a \star b = a^b + b^a$, for all positive integer values of a and b , then what is the value of $5 \star 4$?
46. Each bounce of a ball goes $\frac{1}{3}$ as high as the previous bounce. The second bounce was 24 inches high. What was the height, in inches, of the first bounce?
47. The perimeter of an isosceles triangle is 16 cm, and the altitude to its base is 4 cm. What is the number of square centimeters in the area of the triangle?
48. There are 50 equally-weighted questions on Mr. Smith's math final. If a student must score 93% or greater to get an "A", what is the minimum number of questions that must be answered correctly to pass?
49. A pizza parlor offers six toppings. What is the greatest number of three-topping pizzas that can be made such that no two pizzas have the same topping combination?
50. Jack bought a CD for \$11 and sold it for \$21. He then bought it back for \$29 and sold it again for \$28. How many dollars profit did he make?
51. What is 150% of 0.86, to the nearest hundredth?

52. Given $\frac{x}{y} = \frac{3}{5}$ and $\frac{y}{z} = \frac{5}{3}$, what is the value of x/z ?

53. What is the greatest odd integer that is a factor of $6!$?

54. What is the number of centimeters in the diameter of a circle whose area is $100\pi^3$ cm^2 ?

55. Compute: $2015 \div 2015 \frac{2015}{2016}$. Express your answer as a common fraction.

56. One leg of a right triangle is increased by 20%, and the other leg is decreased by 20%. By what percent does the area of the triangle decrease?

57. Data can be entered at the rate of 150 pieces of information in 12 minutes. At this rate, how many pieces of information can be entered in $2 \frac{1}{2}$ hours?

58. A portion of a number line is divided into 3, as shown. $AB = 8$, $AP = 5$, and $OB = 6$. Find OP .



59. Ralph can do two-third of a job in one-thirds of an hour. At this rate, how many hours will it take him to finish the entire job?

60. Today is April 30th. What month will it be 100 months from now?

61. It is known that $\frac{9n}{n+1} > 8$ and n is a positive integer. What is the least possible value for n ?

62. Twenty cards, numbered 1- 20, are placed in a box. One card is randomly selected. What is the probability that the number on the card is prime and is a multiple of 5? Express your answer as a common fraction.

63. As shown in the figure, a , b , and c are real numbers. Simplify $|b - a| + |a - c| + |c - b|$.



64. During his morning commute to work in rush traffic, Bob's average speed was 3 km per hour. During his afternoon commute back home along the same route, his average speed was 5 km per hour. The distance from his house to his office is 10 km. What was his average speed for the entire round trip? Express your answer as a common fraction.

65. A rectangle has perimeter 50 inches and integer length sides, in inches. What is the number of square inches in the greatest possible area?

66. What is $\frac{1}{2}$ of $\frac{1}{3}$ of $\frac{1}{5}$ of 300?

67. What is the value of x in the equation $\frac{\frac{2}{3} + \frac{1}{5}}{13} = \frac{1}{x}$?

68. Six boys and three girls are seating nine chairs in a row. The girls arrive before the boys and decide to choose their chairs so that each girl will be between two boys. In how many ways can girls choose their chairs?

69. What is the greatest common factor of 102 and 114?

70. The angle measures of the three angles of a triangle are in the ratio 1:3:6. What is the number of degrees in the measure of the smallest angle?

71. What is the least common multiple of 1, 2, 3, 4, 5, 6, 7, 8, and 9?

72. Express as a common fraction: $\sqrt{7\frac{1}{9}}$.

73. The number 119 can be written as $13q + r$ where q and r are integers and $0 < r < 13$. What is the value of $q - r$?

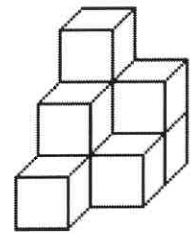
74. How many seconds are in $2\frac{1}{9}$ hours?

75. If Mike drinks four 16-ounce glasses of water each day during 2015, how many gallons of water will he consume? (A gallon is 128 ounces.) Express your answer as a decimal to the nearest tenth.

76. Two opposite sides of a square are each increased by 50%, while the other two sides are each decreased by 30%. The area of the original square is increased by what percent?

77. A rectangle has an area of 60 m^2 and the perimeter of 34 m. What is the number of meters in the diagonal of the rectangle?

78. As shown in the figure, the solid is formed by gluing six unit cubes together. What is the number of square units of the surface area of the solid?



79. What is the greatest possible value of $x - y$ if $x^2 - y^2 = 1991$? Both x and y are positive integers.

80. Box A contains 18 cards, numbered 1- 18. Box B contains 18 cards, numbered 19-36. Alex reaches in box A and draws out x cards at one time. Bob reaches in box B and draws out $3x - 6$ cards at one time. The number of ways Alex draws x cards from box A is the same as the number of ways Bob draws $3x - 6$ cards from box B. What is the sum of all possible values for x ?