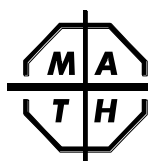## July, 2016—Calculators are PROHIBITED

"Speed Test 50" Questions—Time Limit 60 minutes **(2 points each)**

Directions

- This is a test of speed and accuracy.

- The questions are **NOT** arranged in order of difficulty.

- Answers exactly equivalent to the official answers will be given credit.

- No one is expected to solve all 50 questions in the time given.

- Do not spend too much time on any one question.

- Write your answer to each question in the answer box to the right of each question.

- Each question is worth 2 points.

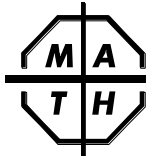- You will have 60 minutes in which to answer 50 questions.

July, 2016—Calculators are PROHIBITED

"Speed Test 50" Questions—Time Limit 60 minutes—PAGE 1 of 3
Write your answer in the answer box to the right of each question. **(2 points each)**

Name:_____ Number Correct:_____

|	
1. What is the value of $(1 + \dfrac{1}{0.1})^2$?	1.
2. $74 + 7 + 9 + 1926 = 2000 + \underline{?}$	2.
3. When written in standard form, how many zeros does $(10^{10})^{10}$ have?	3.
4. A pen and a pencil together cost $1.30. If the pen costs $1 more than the pencil, how much does the pencil cost in dollars?	4.
5. If a map has a scale of 1 cm to 20 km, then on this map how far apart are two towns that are actually 138 km apart?	5.
6. What is the reciprocal of $(\dfrac{1}{5} + \dfrac{1}{12})$?	6.
7. How many of the first 100 positive integers have exactly 3 positive integral divisors?	7.
8. How many integers greater than 4000 and less than 5000 are divisible by 4 or 7?	8.
9. What is the smallest possible length of a side of a acute triangle, all of whose sides have integral lengths?	9.
10. Anna's brother has 1 more brother than he has sisters. How many more brothers does his sister Anna have than she has sisters?	10.
11. Two integers between 10 and 99 have the same digits but in different order. What is the greatest possible value of the difference of these integers?	11.
12. How long is a side of a square with numerically equal area and perimeter?	12.
13. What is the greatest possible area of a rectangle whose perimeter is 100?	13.
14. What is the greatest integer that is less than or equal to $-\pi$?	14.
15. True/False: It is possible for a trapezoid to have exactly 3 congruent angles.	15.
16. True or False: 377 is a prime.	16.
17. I bought a painting for $1 and then sold it for a profit of 10000% on my cost. For what price in dollars did I sell this painting?	17.
18. What is the length of a side of a rhombus whose diagonals have lengths 3 and 4?	18.
19. A computer can download 2% of a file in 10 seconds. How many seconds does it take to download 100% of the file?	19.

July, 2016—Calculators are PROHIBITED

"Speed Test 50" Questions—Time Limit 60 minutes—PAGE 2 of 3

Write your answer in the answer box to the right of each question. **(2 points each)**

Name:_____ Number Correct:_____

20. What is the length of the altitude to the shortest side of a triangle with side-lengths of 3, 4, and 5?	20.
21. What is the perimeter of a right triangle with one leg of length 51 and the hypotenuse of length 85?	21.
22. True/False: The product of 2 different prime numbers is always odd.	22.
23. True/False: The sum of 2 different composite numbers can be a prime.	23.
24. True/False: The sum of 2 different primes can be a composite number.	24.
25. What is the smallest integer greater than 999 which uses only the digit 9 and is divisible by 999?	25.
26. If the last three digits of an integer ends in 625, then the number must be divisible by n. What is the largest possible value of n?	26.
27. Rotating an image 2016° clockwise is the same as rotating it $d°$ counterclockwise, where $0 < d < 360$. What is the value of d?	27.
28. A watch loses 1 second per day. How many days will it take for this watch to lose 24 hours?	28.
29. What is the largest integer less than 10 000 that is contained in the arithmetic sequence, 1, 5, 9 . . . .?	29.
30. What is the smallest multiple of 4 between 100 and 1000 whose digits have a sum of 20?	30.
31. In a sequence, each term is 3 more than the previous term. If the fifth term is 5, what is the first term?	31.
32. What is the smallest positive integer n that satisfies $2^n > 6n^2$?	32.
33. What is the smallest n for which a regular n-gon has each angle $\geq 162°$.	33.
34. What is the sum of the reminders when each of the first 100 integers is divided by 6?	34.
35. What is the sum of the remainders when 20 is divided by each of the positive integers greater than 1 and less than 20?	35.
36. $1 - 2 + 3 - 4 + 5 - . . . + 2011 - 2012 = ?$	36.
37. What is the positive difference between the least common multiple of 15 and 20 and the greatest common factor of 15 and 20?	37.
38. In writing every integer from 200 to 400, how many times is the digit 1 written?	38.
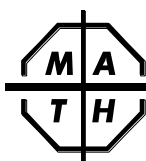
July, 2016—Calculators are PROHIBITED

"Speed Test 50" Questions—Time Limit 60 minutes—PAGE 3 of 3

Write your answer in the answer box to the right of each question. **(2 points each)**

Name:_____ Number Correct:_____

39. My teacher raised my grade of 50 by 20%. The principal then reduced my new grade by 20%. What was my grade after the principal changed it?	39.
40. What is the greatest prime factor of the sum of the first 200 positive integers?	40.
41. How many different whole numbers between 100 and 600 can be formed using three different digits from the digits 1, 2, 3, 4, and 5?	41.
42. True or False: If a, b, and c are the lengths of the sides of a triangle, then there is always a triangle with sides of length a^2, b^2, and c^2?	42.
43. Plant 1 of height 5 cm grows uniformly at a rate of 1 cm/week. Plant 2 of height 7 cm grows uniformly at a rate of 2 cm every 3 weeks. In how many weeks are they the same height?	43.
44. The average grade of my first three math tests was 70%, but after my fourth test my average was 75%. What grade did I receive on my fourth test?	44.
45. What is the area of a circle whose circumference is $2\pi^2$?	45.
46. I traveled 1 km at 2 km/hr and 2 km at 1 km/hr. What is my average speed in km/hr for the entire 3 km trip?	46.
47. If the area between a square and its inscribed circle is $16 - \pi^2$, what is the area of the square?	47.
48. True/False: The sum of 2017 odd integers can never equal 2016.	48.
49. On a circular clock, what is the measure of the smaller angle formed between the minute hand and the hour hand at 3:15 P.M.?	49.
50. True/False: Given any 4 integers, there is always a nonempty subset whose sum is divisible by 4.	50.