Math Power

Name:
(First)_____(Last)_____

School: _____ Grade:_____

Score: _____

Parent's Name: _____   Date: _____/_____

Parent's Signature: _____   Parent's Email: _____@_____

1. This contest is conducted under my supervision.

2. There is no time limit for this contest.

3. No calculator/device should be used.

4. This test is not for distribution.

5. No email should be used for submission.

I choose to

☐ By 1/6   Mail-in this test in stapled hardcopy: P. O. Box 10893, Rockville, MD 20849

☐ By 1/8   Drop-In this test in stapled hardcopy: 10101 Molecular Dr, Ste 100, MD 20849 (3:00 – 6:30 pm)

Show your work for each question to receive credit.
Circle your answer to be graded.

Gazelle

Winter Math Contest: Gazelle Level

1. Suppose that it takes Carl 7 seconds to type 40 words. How long (minutes/seconds) does it take him to finish a 2400-word for social studies report?

2. A plane leaves Miami at 4:35 pm and arrives at Boston at 7:05 pm. How long (in hours) did the trip take?

3. A handball tournament was played in two rounds. The first round took $1\frac{3}{4}$ hrs to complete, the recess took 10 min, and the second round took $1\frac{1}{2}$ hrs. If the game started at 1:40 pm, what time did it end?

4. The Yellow bus passes Jamie's house every 25 minutes, and the Green bus passes every half hour. Jamie saw both buses at 1:10 pm from her house. When will Jamie see both buses from her house next time?

5. A train running between Cedarville and Mountainville left Cedarville at 8:47 am and reached Mountainville at 10:12 am How many minutes did the trip take?

6. $2\frac{1}{4}$ hours = ___ hours ____ minutes

7. Ben can run at a rate of $2\frac{1}{2}$ blocks per minute.
   (a) How many minutes does he take to run 7 blocks?

   (b) Write the answer in minutes and seconds.

Question set [8 - 9]

Joyce saw a sweater that was originally $60 but went on sale for $\frac{1}{5}$ off the original price.

8. What was the amount of the discount for the sweater?

9. What is the new price of the sweater?

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10. Ms. Rambo earns $15 per hour as an assistant bookkeeper. She works 7 hours and 24 minutes per day and 6 days a week. How much does she earn in two weeks?

11. The San Francisco 49ers are playing the New York Jets in N.Y. The flight takes 4 hours and 20 minutes. If 49ers leave at 1:30 pm, what is the local time when they arrive in New York? (Hint: San Francisco local time is 3 hours behind New York local time.)

12. The Scientific Mysteries Program sells 14 minutes of program time to advertisers. The Mental Marvel company bought $\frac{5}{6}$ of advertisement time. How many minutes and seconds did The Mental Marvel buy?

13. William can take 8 photos in 14 minutes. How long (hr/min) will it take him to take 120 photos?

14. George wants to drive $10\frac{1}{2}$ hours on Friday. If he drives $3\frac{1}{2}$ hours in the morning and $4\frac{3}{4}$ in the afternoon, how many hours must he drive that night?

15. If a car travels 50 miles per hour, how many hours does it need to travel 250 miles?

16. If a car travels 50 miles per hour, how many hours and minutes does it need to travel 240 miles?

Question set [17 - 19]

Diane is going to visit her parents in New York City, 150 miles away from her school in Albany. She drives 60 miles per hour constantly.

17. How many long does she need to drive in one way?

18. If her parents expects her by 6:00 pm, and what time is she supposed to leave her school?

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19. If her car gets 20 miles per gallon, how many gallons does she need to travel to her parent's house and return to her school?

20. An airplane climbs 400 feet per second. how many <u>minutes</u> (in fraction) does it need to climb 32,000 feet?

21. The sales tax is 5%. What is the sales tax for a book priced $50?

22. Janice wants to buy some brocade ribbon $1\frac{1}{2}$ inches wide to make bookmarks. She wants to make a dozen with $6\frac{1}{8}$ inches long and a dozen with $9\frac{3}{4}$ inches long. How many inches of the brocade ribbon should Janice buy?

23. What was the perimeter, in <u>feet</u>, of the garden that Harry planned?

24. What was the area, in square <u>feet</u>, of the garden that Harry planned?

25. Suppose Harry decided to change the shape of his garden to a square with the same area as the rectangle. What would be the perimeter, in <u>feet</u>, of the square garden?

26. Each circle represents a bag and the number of dollars in each bag. As many bags can be taken as long as no two are on the same diagonal line. The largest amount of money that can be taken is _____ dollars.
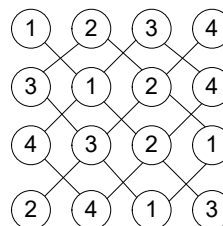
Question set [**23 - 25**]
Harry planned a rectangular garden that was 12 yards long and 9 feet wide.
(Hint: 1 yd = 3 ft)

Show your work for each question to receive credit.
Circle your answer to be graded.

Gazelle

$$
\begin{array}{ccccc}
 & 5 & K & 3 & L \\
- & M & 4 & N & 1 \\
\hline
 & 4 & 4 & 5 & 1 \\
\end{array}
$$

27.

In the subtraction shown, K, L, M, and N are digits. What is the value of $K + L + M + N$?

A) 20
B) 19
C) 16
D) 13
E) 9

28. Find the value for the □:
$$5^6 \div 5^2 = 5^{\square}$$

29. The operator of the Audio Warehouse is planning a grand opening. He wishes to advertise that the store has many different sound systems available. They stock 10 different tape decks, 12 different receivers, and 9 different speakers. Assuming that a sound system will consist of one of each, and that all pieces are compatible, how many different sound systems can they advertise?

30. A N64 controller was priced at $40. There is a 25% discount now. What is the current price of the controller?

31. Gregg traveled 320 miles on Monday. He had $\frac{2}{3}$ of the entire trip left for Tuesday. How far did he travel on Monday and Tuesday?

32. The rectangle shown below has length 15 inches and perimeter P inches. Express the width of the rectangle.
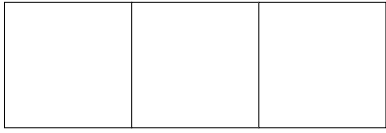

15
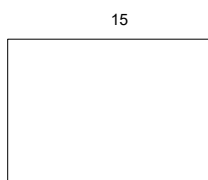
A) $\frac{1}{2}P$ - 30
B) $\frac{1}{2}P$ - 15
C) $\frac{1}{2}(P - 15)$
D) $\frac{1}{2}P$ + 15

33. Mark earns $60 for 8 hours. How much should he get paid for 20 hours?

Show your work for each question to receive credit.
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Gazelle

34. A rectangle is formed by connecting three equal squares. The rectangle has a perimeter of 24 in. The area of the rectangle = _____ in².

35. If a charter bus can travel 160 miles in 3 hours and 12 minutes, how many hours and minutes will take to travel 350 miles?

36. A man has to be at work by 9:00 A.M. and it takes him 15 minutes to get dressed, 30 minutes to eat and 1 hour and 25 minutes to drive to work. What time should he get up?

37. If Bob left his house at 7 A.M. and rode his bike 56 miles by 11 A.M., what was his speed?

38. If a car can travel $30\frac{1}{4}$ miles on $2\frac{1}{2}$ gallons of gas, how much gas is needed for a 121-mile trip?

39. A pencil costs $0.30 at a store. Ken bought a dozen of pencils and 4 erasers. The total price is $7.20. What is the price of an eraser?

40. Paul paid $3.90 for 3 pencils and 2 erasers. If a pencil costs 50¢, how much does an eraser cost?

41. Sam bought three erasers and two mechanical pencils for a total of $6.80. A mechanical pencil is listed at $2.50. How much does it cost to buy a dozen erasers?
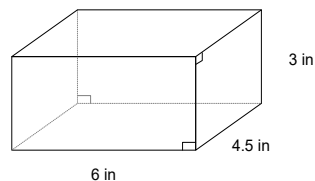
42. Five candidates Alex, Ben, Carl, David, and Eden running for chair and vice-chair of the Social Studies Club. How many different outcomes can the election take place?

Show your work for each question to receive credit.
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Gazelle

43. A retailer has some ties that cost him $5 each. He wants to sell them at a profit of 70% of the cost. What should be the selling price of the ties?

44. Three fishermen caught 29 fish altogether. They decided to make a soup. To keep the same number of fish and give some to make a soup, the first fisherman gave 5 fish, the second one gave 4, and the third one gave 2 fish. How many fish did the first one catch?

45. The dimension of a rectangular field is 120 yd by 80 yd. A 10-yard wide sidewalk is to be built around the field. What is the area in square yard of the sidewalk (shaded part)?

46. How many blocks of 1.5in×1.5in×1.5in (at most) can be placed in rectangular box below?

Question set [47 - 49]

There are 10 white, 20 red, and 30 blue marbles in the bag.
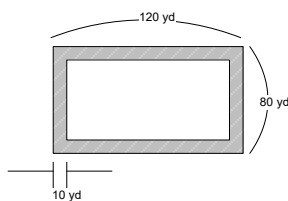
47. What is the least number of the marbles one has to take from the bag to make sure that there are 3 red marbles?

48. What is the least number of the marbles one has to take from the bag to make sure that 3 marbles of different color?

49. What is the least number of the marbles one has to take from the bag to make sure that 3 marbles of the same color?

Show your work for each question to receive credit.
Circle your answer to be graded.

Gazelle

50. The fish tank's height is 35 cm. When it is filled with 60 liters of water, the water level in the tank is 20 cm. What is the maximum amount of water this tank can hold?

51. Bernice the bricklayer can set about 96 bricks per hour. If her workday is $7\frac{1}{2}$ hours long, how many bricks can Bernice set in a day?

52. Althea collects postage stamps. She has $\frac{16}{64}$ of the postage stamps that she wants for her collection. What is $\frac{16}{64}$ expressed as a percent?

53. The students at Bruckner Middle School made a smaller copy of the 8-foot by 8-foot tiger mascot banner that hangs in the gym. The new banner will hang in the school hallway. Its sides are $\frac{1}{2}$ the length of the sides of the gym banner.
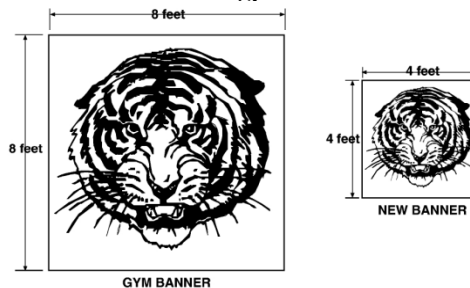
How many times larger is the area of the gym banner than the area of the new banner?

54. The growing records of Dave and Ed are listed below.
Dave: from 4 ft 2 in to 4 ft 8 in during 3 months.
Ed: from 4 ft 9 in to 5 ft 5 in during 4 months.
Who is growing faster?
A) Dave
B) Ed
C) Both the same

55. The Crockett family has a large garden planted with their two favorite vegetables: corn and beans, which they plant in rows. Out of every 19 rows, 14 are corn. If they have 35 rows of beans, how many rows of corn do they have?

Show your work for each question to receive credit.
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Gazelle

56. Mr. Thompson paid $9.45 for 3 rolls of film. How much did 5 rolls cost?

GT Math Contest

61. What is the average of the first 1995 positive integers?
    A) 997.5
    B) 998
    C) 998.5
    D) 999

Question set [**57 - 58**]

Jake and Kim made different trips last week.

57. In a hiking trip, Jake climbed 15 miles. He still had $\frac{3}{8}$ to finish. What was the total distance of this trip?

62. 4.5 hours is equivalent to each of the following except
    A) $\frac{3}{16}$ day
    B) 270 min
    C) 16,200 sec
    D) $\frac{1}{100}$ week

58. In a biking trip, Kim finished 15 miles, which was $\frac{3}{8}$ of the entire trip. What was the total distance of the trip?
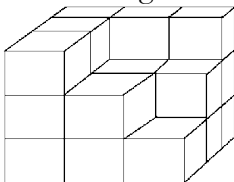
63. Alyas necklace broke. She found $\frac{1}{2}$ of the beads on the floor and $\frac{1}{4}$ on the couch. $\frac{1}{6}$ of the beads remained strung on the necklace, and 12 beads were never found. How many beads were originally on the necklace?

59. $1.5^2 =$

60. There are 15 boys and 10 girls in a classroom. The percent of girls in the classroom = _____.

64. Find the ones digit of: 3^{2003}.

Show your work for each question to receive credit.
Circle your answer to be graded.

Gazelle

65. How many unit cubes are needed to build this solid figure?

66. In the figure below, when the number of shaded square is 1, the number of unshaded squares is 8; when the number of shaded square is 2, the number of unshaded squares is 10; when the number of shaded square is 3, the number of unshaded squares is 12. If the pattern continues, how many unshaded squares are there when there are 100 shaded squares?
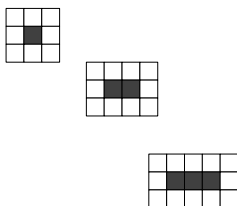
67. Of 30 students, two-tenths got As. How many got As?

68. Suppose it is 12:00 A.M. What will the time be in a thousand minutes?

69. The value of 25 pennies + 50 nickels + 100 dimes is the same as the value of _____ quarters.

70. What is the product of $(-\frac{1}{7})^{50}$ and 7^{100}?
    A) 50×7
    B) 7^2
    C) 50×7^2
    D) $(-7)^{50}$

71. What is the average of 13, 19, 25, and 31?

72. $30 = 0.1\%$ of _____

73. All the following have 2, 3, 5, 6, 10, 15, and 30 as factors except
    A) 543420
    B) 85030
    C) 72630
    D) 53430

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Circle your answer to be graded.

74. Find the next number in the following sequence: 14, 19, 26, 35, …

75. How many thousandths, when added together, equal one tenth?
    A) 100
    B) 1000
    C) 10,000
    D) $\frac{1}{100}$

76. In how many different ways can the cars of a three-car train be arranged?

Question set [**77 - 78**]

Number Riddles.

77. Use each of 2, 4, 5, and 7 once to make a 4-digit number. There are 24 of them. However, there is only one which is a multiple of 2475. Find this number.

78. A 4-digit number, with different digits, is read in reverse (right to left), the value of the new number would be 9 times the value of the original number. What is the original 4-digit number?

79. Some kids went on a school ski trip by car, 3 to a car, and the rest went by van, 5 to a van. In total, 140 kids went, using 40 vehicles. How many kids went by car?

80. The sum of the squares of the lengths of the 3 sides of a right triangle is 800. Find the length of the hypotenuse.
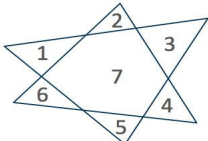
81. The numbers 2, 4, 6, and 8 are a set of four consecutive even numbers. Suppose the sum of five consecutive even numbers is 320. What is the smallest of the five numbers?

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Gazelle

82. Two triangles can form 7 separate regions.

How many separate regions do three triangles form?
A) 20
B) 19
C) 18
D) 17

83. A student averages 72 on 5 different tests. If the lowest score is dropped, the average rises to 84. What is the lowest score?

84. Each different letter represents a different digit and AC, BC and CF represent 2 digit numbers. A letter represents the same digit each time it appears.

$A \times B = B$
$B \times C = AC$
$C \times D = BC$
$D \times E = CF$

Find the digit that F represents.

85. How many 4-digit passwords are possible if I use only 4 digits?
A) 16
B) 44
C) 128
D) 256

86. I buy 5 eggs for $1 and sell them all for $5 each. What is my profit per egg?
A) $24.00
B) $12.00
C) $5.00
D) $4.80

87. Jack is paying $27 a month on a loan of $810. How long does it take him to pay off the loan?

88. Ramona can walk at 2 miles per hour going up a mountain. Going down the same trail, she can walk at 6 miles per hour. If she spends no time at the top, what will be Ramona's average speed for the whole hike?

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89. The Pizza Place has three tables. The biggest one seats three times as many people as the smallest one. The middle-sized table seats twice as many people as the smallest one. On Tuesday night $\frac{3}{4}$ of the seats were taken. Then twelve more people arrived. Unfortunately there were only enough seats for half of them. How many people can sit at the smallest table?

90. Posts of equal diameter are used to make a square fortress. There are 19 masts needed each side. How many masts are needed for the fortress?

Show your work for each question to receive credit.
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Gazelle