Math Power

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Name: (First)_____(Last)_____

School: _____ Grade:_____

M5

Problem Solving

Question set [**1 - 4**]

Connie calls home collect every week and talks 13 min.

Collect calls	First 3 min	Each additional min
Monday - Friday	$2.15	$0.35
Saturday - Sunday	$2.05	$0.15

1. What is the charge if she made her calls during weekdays?

2. What is the charge if she made her calls on weekend?

3. How much would her parents save if she made her collect calls on the weekend?

4. If she wants to spend $5.20 in collect call during weekend, how many minutes can she talk?

5. Ashley's Boogie Board cost $80.00. She uses it everyday for 5 days, for 5 hours each day. How much is that an hour?

6. Five brothers want to buy a video game and game cartridge. Three brothers have $45 each to spend. The two remaining brothers decide to split the balance equally. If the total cost of the video game and cartridges is $255, how much will the two brothers each need to contribute?

7. An average of 480 people visit Highland Lake each day. 70% of the people go swimming. How many people go swimming?

Question set [**8 - 9**]

Diane is going home to visit her family for the holiday. She needs to be sure that she will be home on time. She lives in New York, which is 90 miles away.

8. If she needs to be home by 4:00 P.M., and she can drive 60 miles per hour, when should she leave?

9. Her car gets 20 miles per gallon. How much gas should she be sure to have so that she has enough for the trip back as well?

10. A vacuum cleaner selling for $125 is on sale for $89.85. If Alan buys the vacuum cleaner now, how much will he save?

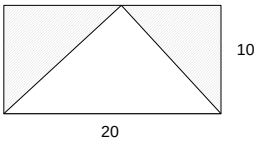
Question set [**11 - 12**]

At Chicago's Albany Park Multicultural Academy, 40% are Hispanic, 25% are Asian, 15% are African American, and the rest are Caucasian.

11. Express the percents of the four group simplest fractions.
    Hispanic: 40% =
    Asian: 25% =
    African American: 15% =
    Caucasian: 20% =

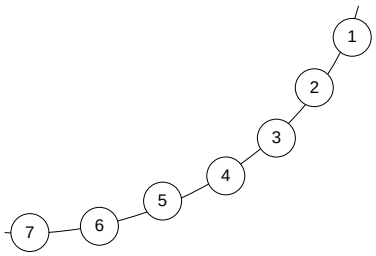
12. If the academy has 120 students, how many students are there in each group?
    Hispanic:
    Asian:
    African American:
    Caucasian:

13. Find the shaded area.



14. A study reveals that among 30 million adolescents between 10 and 18 years of age 1.5 million of these teens are homeless. What part of adolescents are homeless?

15. A group of children stand holding hands in a large circle and a teacher walks around the circle giving each child in order a number 1, 2, 3, 4, …



If number 12 is standing opposite number 30, how many children are there in the circle?

Question set [**16 - 21**]

Each letter from P to Y has its own meaning, for example, P is the total number of heads (of chickens and Pigs) in the pink ranch and X is the total number of legs in the blue ranch. A farmer raises his chickens and pigs in three ranches: pink, green and blue.

	pink	green	blue
# chickens	10	R	X
# pigs	6	10	Y
# heads	P	16	6
# legs	Q	S	20

16. P =

17. Q =

18. R =

19. S =

20. X =

21. Y =

22. A recipe needs $1\frac{1}{3}$ cups flour for 1 dozen cookies. How much flour would you need to make $4\frac{1}{2}$ dozen cookies?

Question set [**23 - 24**]

Consider the following two related age problems.

23. Three years ago, James was 3 times as old as Isaac. The sum of their ages was 40. How old are they at present?

24. In three years, Pamela will be 3 times as old as Queen. The sum of their ages will be 24. How old are they at present?

25. A can of coke sells for $.75 on a vending machine. Jim has five dollars. How many cans at most may he purchase?

26. BHA is a preservative that is added to foods to preserve freshness. A can of shelled walnuts, for example, contains 0.02% BHA. Express this percent as a fraction in simplest form.

27. A 6-ounce can of orange juice sells for $0.90, and an 8-ounce can sells for $1.28. Which is a better buy?

Question set [**28 - 29**]

Answer the following questions.

28. 0 is a positive whole number. (True or False)

29. 24 is an even number. (True or False)

30. Farmer Bo has a field with 60 rows, each with 58 cornstalks. Farmer Joe has 61 rows with 57 cornstalks in each. Who has the most cornstalks? Show your work.

Question set [**31 - 32**]

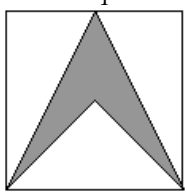
A binder costs $3 and a pack of loose-leaf paper cost $2.

31. How much does it cost Tom to buy 2 binders and 3 packs of paper?

32. Tom has $20. If he wants to buy 3 binders, how many packs of loose-leaf paper at most can he purchase?

33. A stationary store sells a certain type of envelope in packets of 25. The envelopes are shipped to the store in cartons that contain 20 packets. How many envelopes are there in a shipment of 4 cartons?

34. An arrow is formed in a 2×2 in square by joining the bottom corners to the midpoint of the top edge and the center of the square.



Find the area of the arrow.

35. A square is 5 ft each side. What is the perimeter of the square?

36. A recipe for chocolate chip cookies calls for $1\frac{1}{4}$ cups of flour and 1 cup of sugar. The recipe will make $3\frac{1}{2}$ dozen cookies. How many cups of flour will be needed to make 14 dozen of cookies?

Question set [**37 - 39**]

Each of 5 cousins is a different age. From youngest to oldest, they are Alex, Ben, Camilla, Derek and Elsa. The average age of the cousins is 15.

37. If they were born one year apart, what are their present ages?

38. If they were born two years apart, what are their present ages?

39. What is the sum of their present ages?

40. A program for the game is $3.50. If 54,000 fans bought a program, how much money was paid?

Operating Mixed Numbers

41. $\begin{array}{r} \frac{3}{5} \\ +\ \frac{1}{35} \\ \hline \end{array}$

42. $\begin{array}{r} 3\frac{3}{25} \\ -\ \frac{4}{5} \\ \hline \end{array}$

43. $\begin{array}{r} \frac{7}{10} \\ +\ \frac{1}{6} \\ \hline \end{array}$

44. $\begin{array}{r} \frac{2}{3} \\ -\ \frac{1}{10} \\ \hline \end{array}$

45. $\begin{array}{r} 3\frac{2}{3} \\ +\ 100\frac{5}{12} \\ \hline \end{array}$

46. $\begin{array}{r} \frac{3}{4} \\ +\ \frac{5}{16} \\ \hline \end{array}$

47. $\begin{array}{r} \frac{2}{3} \\ -\ \frac{1}{10} \\ \hline \end{array}$

48. $\begin{array}{r} \frac{5}{6} \\ +\ \frac{3}{4} \\ \hline \end{array}$

49. $\begin{array}{r} \frac{7}{10} \\ +\ \frac{1}{6} \\ \hline \end{array}$

50. $\begin{array}{r} \frac{5}{8} \\ -\ \frac{1}{3} \\ \hline \end{array}$

51. $\begin{array}{r} \frac{3}{8} \\ -\ \frac{1}{6} \\ \hline \end{array}$

52. $\begin{array}{r} \frac{3}{4} \\ +\ \frac{1}{6} \\ \hline \end{array}$

53. $\begin{array}{r} \frac{3}{5} \\ -\ \frac{1}{3} \\ \hline \end{array}$

54. $\begin{array}{r} \frac{3}{8} \\ +\ \frac{1}{6} \\ \hline \end{array}$

55. $\begin{array}{r} \frac{7}{10} \\ +\ \frac{1}{6} \\ \hline \end{array}$

56. $\begin{array}{r} 30\frac{7}{12} \\ -\ 20\frac{3}{8} \\ \hline \end{array}$

57. $\begin{array}{r} 5\frac{8}{15} \\ -\ 5\frac{1}{6} \\ \hline \end{array}$

58. $\begin{array}{r} 300\frac{7}{20} \\ +\ 100\frac{2}{30} \\ \hline \end{array}$

59. $\begin{array}{r} 9\frac{7}{16} \\ -\ 9\frac{3}{12} \\ \hline \end{array}$

GT Assessment Test

60. What is the value of Δ that makes the equation below true?

$\frac{75}{\Delta} - 1 = 4$

Question set [**61 - 63**]

Harry planned a rectangular garden that was 12 yards long and 9 feet wide.
(Hint: 1 yd = 3 ft)

61. What was the perimeter, in feet, of the garden that Harry planned?

62. What was the area, in square feet, of the garden that Harry planned?

63. 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 feet, of the square garden?

64. Why can't a person's hand be 12 inches wide?

65. A palindromic number reads the same forwards as backwards. For example: 88, 3773, 6776. How many palindromic numbers are there between 10 and 200?

66. The classrooms in Hank's school are numbered 1 to 12. The first teacher opens all the doors. The second teacher closes the doors of the even-numbered rooms. The third teacher changes every third door, opening the ones that are closed and closing the ones that are open. How many of the 12 doors are open after the third teacher finishes?

67. Dylan has a bag containing 15 marbles. The table below shows the number of marbles of each color in the bag. As part of a probability experiment for his science class, Dylan randomly picks a marble from the bag and then replaces it. He repeats this 300 times.

DYLAN'S BAG OF MARBLES

Marble Color	# Marbles
White	3
Red	8
Blue	3
Black	1

(a) Dylan randomly picks a marble from the bag. What is the probability the marble will be red?

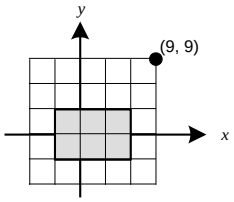
(b) Predict the number of times out of 300 Dylan will pick a red marble.

68. Discover the connection between the letters and the numbers. Which number should replace the question mark?

G	7
M	13
U	21
J	10
W	?

(A) 14
(B) 23
(C) 9
(D) 26

69. What is the area of the shaded rectangle drawn on the coordinate plane shown below?
(Hint: Find the scale first.)



Assessment Test

70. Three chimpanzees weigh 62, 75, and 72 pounds. Which weight is a reasonable average weight of the chimpanzees?
(A) 80 lb
(B) 75 lb
(C) 70 lb
(D) 65 lb
(E) 60 lb

71. Mrs. Jones recorded the following grades for the math test:
65, 100, 95, 85, and 70. What was the average (mean) for this test?
(A) 79
(B) 83
(C) 104
(D) 415

72. Dave, Judy, and Marco bought a large submarine sandwich for $19.05. How much did each pay if they shared the price of the submarine equally?

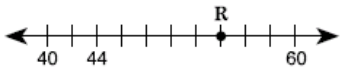
73. The Diaz family was planning a vacation. A five-day river rafting trip would cost the family $225.99 for each day. A cruise to Hawaii would cost $2,651. What is the difference in the cost of these trips?
(A) $1,520.95
(B) $1,521.01
(C) $1,521.05
(D) $1,521.10

74. Javiar drove his car for 4 hours at 45 miles per hour and for 3 hours at 50 miles per hour. Which expression could be used to find the total number of miles that Javier drove his car?
(A) 45 - 4×50 - 3
(B) 45 + 50×4
(C) 45 + 4×50+3
(D) 45×4 + 50×3
(E) Not Here

75. Clyde and Anita were making barbecue sauce. Clyde's recipe called for $\frac{1}{2}$ cup of honey, and Anita's recipe called for $\frac{3}{16}$ cup of honey. Which shows the correct relationship between these fractions?
(A) $\frac{1}{2} > \frac{3}{16}$
(B) $\frac{1}{2} < \frac{3}{16}$
(C) $\frac{3}{8} > \frac{1}{4}$
(D) $\frac{1}{2} < \frac{3}{16}$

76. How is the product 3×3×5×5×5×7 expressed in exponential notation?
(A) 3×3×5×5×7
(B) $3\times3\times5^2\times7$
(C) $3^2\times5\times5^2\times7$
(D) $3^2\times5^3\times7$

77. Which best describes the location of point R on the number line shown below?



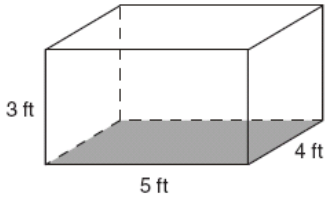
(A) 49
(B) 50
(C) 54
(D) 58

78. What is the missing number that follows the pattern?

1, 6, 2, 7, 3, 8, ___

(A) 16
(B) 12
(C) 10
(D) 5
(E) 4

79. A rectangular rabbit cage is shown below.



What is the perimeter of the bottom of the rabbit cage?

(A) 12 feet
(B) 16 feet
(C) 18 feet
(D) 20 feet

80. Write the decimal 0.125 as a fraction in simplest form.

81. The total area of two walls is 23 m^2. A roll of wallpaper covers 8 m^2. The store sells only full rolls. What is the fewest number of rolls needed to cover the two walls?

(A) 1 roll
(B) 2 rolls
(C) 3 rolls
(D) 4 rolls

82. Greg purchased 4 paperback books. Each book costs between $4.99 and $8.99. What is a reasonable total cost for the books?

(A) $10
(B) $30
(C) $15
(D) $45
(E) $50

83. The table shows the results of 18 spins Jules made with a spinner.

Spinner Results

Fruit	Number of Spins
Grape	5
Apple	4
Orange	6
Pear	3

Based on these results, what is the probability that Jules's spinner will land on the apple on his next spin?

(A) $\frac{2}{9}$
(B) $\frac{1}{4}$
(C) $\frac{2}{7}$
(D) $\frac{1}{3}$

84. An advertisement is shown below.

Which problem matches this advertisement?

(A) The regular prices of 2 kinds of phones are $20 and $39. If Ms. Chung buys 1 of each kind of phone, what will be the total cost of the phones?

(B) The regular price of a phone is $39. The phone is on sale for 20% off the regular price. What is the sale price of the phone?

(C) The regular price of a phone is $20. The phone is on sale this week for 39% off the regular price. What is the sale price of the phone?

(D) The regular price of a phone is $39. If Ms. Chung buys 1 phone at the regular price, the second phone will cost 20% less. What will be the total cost of the phones?

85. Tickets to Splash City cost $10 for adults and $8 for children. If 12 people paid a total of $102, how many were adults, and how many were children?

86. Everyone in art class is making a special plate. The table below shows the different choices of shape, design, and color that can be used.

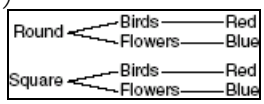
Plate Choices

Shape	Design	Color
Round	Birds	Red
Square	Flowers	Blue

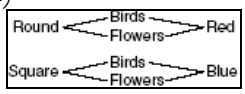
Which of the following tree diagrams shows all the different kinds of plates that can be designed using 1 shape, 1 design, and 1 color?

(A)

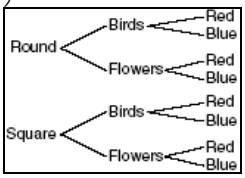
(B)



(C)



(D)



87. Which has the ***smallest*** area?

(A) a rectangle 9 in × 4 in

(B) a square 12 in × 1 ft

(C) a rectangle 1 ft × 3 ft

(A) square 1 yd × 1 yd

88. ΔABC is an equilateral triangle with each side $4\frac{2}{3}$ in. What is the perimeter of the triangle?
(A) 12
(B) 14
(C) 16
(D) 18

89. A sign at the school bookstore read:

Calculator	$5
Notebook	$1
Combination Lock	$3
3-Ring Binder	$2

Donavan purchased 3 notebooks, 2 binders, and a lock. Find the total cost of the items.
(A) $8
(B) $7
(C) $12
(D) $9
(E) $10

Answer Key

Problem Solving

1. 2.15 + 10×0.35 = 5.65
2. 2.05 + 10×0.15 = 3.55
3. 5.65 - 3.55 = 2.10
4. 5 - 2.05 = 3.15 (first 3 minutes)
   3.15÷0.15 = 21
   21 (min)
   3 + 21 = 23 min
5. $3.20
6. $\frac{1}{2}(255- 45\times3) = \$60$
7. 336 = 70%×480
8. By 2:30 P.M. (90 ÷ 60 = 1.5 hr = 1 hr 30 min)
9. 90×2÷20 = 9 gal
10. $35.15
    125-89.85=35.15
11. Hispanic: 40% = $\frac{2}{5}$,
    Asian: 25% = $\frac{1}{4}$
    African American: 5% = $\frac{3}{20}$
    Caucasian: 20% = $\frac{1}{5}$
12. 120×($\frac{2}{5}$; $\frac{1}{4}$; $\frac{3}{20}$; $\frac{1}{5}$) = Hispanic: $120\times\frac{2}{5}$ = 48
    Asian: $120\times\frac{1}{4}$ = 30
    African American: $120\times\frac{3}{20}$ = 18
    Caucasian: $120\times\frac{1}{5}$ = 24
13. $\frac{1}{2}\times20\times10 = 100$
14. $\frac{1.5\text{million}}{30\text{million}} = \frac{1.5}{30}$ (million is canceled) =
    0.05 = $\frac{1}{20}$
15. Let c be the number of children in the circle. Half the children, $\frac{1}{2}c$ will be in-between child 12 and child 30.
    So $12 + \frac{1}{2}c = 30$.
    Therefore $\frac{1}{2}c = 18$.
    That is, there are 36 children in the circle.
16. P = 16 heads
17. Q = 44 legs
18. R = 16 - 10 = 6 heads
19. 2×6 + 4×10 = 52 legs
20. X = 2 chickens
21. Y = 4 pigs
22. $4\frac{1}{2}\times1\frac{1}{3} = 6$ (cups)
23. I = 13 and J = 33
    Three years ago, James was 30 years old and Isaac was 10. At present, James is 33 and Isaac is 13.
24. P = 15 and Q = 3
    Pamela will be 18 and Queen will be 6. At present, Pamela is 15 years old and Queen is 3 years old.
25. 2 × .75 = 1.5
    4 × .75 = 3
    6 × .75 = 4.50
    7 × .75 = 5.25
    At most 6 cans.
26. 0.02% = $\frac{0.02}{100} = \frac{2}{10000} = \boxed{\frac{1}{5000}}$
27. 0.90÷6 = 0.15 per ounce (6-oz)
    1.28÷8 = 0.16 per ounce (8-oz)
    The 6-ounce one is a better buy.
28. False
    0 is a whole number, but it is not positive.

29. True
since the remainder is 0 when it is divided by 2.

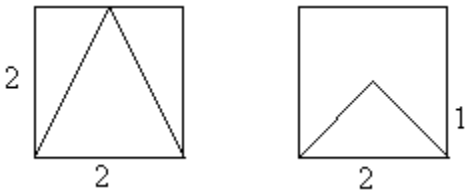
30. Farmer Bo has more. He has 3528 cornstalks. Farmer Joe has 3477.

31. 2×3 + 3×2 = $12

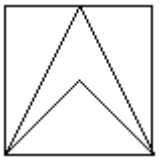
32. 20 - 3×3 = $11

33. 4×20×25 = 2000
(25 packets are irrelevant)

34. 1 sq. in
Consider the two diagrams below.



The area of the square is 4, so the area of the large triangle is 2 (half of the square) and the area of the small triangle is 1 (quarter of the square).



Hence the area of the arrow is 2 − 1 = 1 square unit.

35. 20 (ft)
5×4 = 20 (ft)

36. $14\div(3\frac{1}{2}) = 4$
$4\times1\frac{1}{4} = 5$ (cups)

37. 13, 14, **15**, 16, and 17

38. 11, 13, **15**, 17, and 19

39. 15×5 = **75**

40. 3.5×54000
= 7×27000
= $189000

Operating Mixed Numbers

41. $\begin{array}{r} \frac{21}{35} \\ +\ \frac{1}{35} \\ \hline \frac{22}{35} \end{array}$

42. $\begin{array}{r} 3\frac{3}{25} \\ -\ \frac{20}{25} \\ \hline 2\frac{8}{25} \end{array} = \begin{array}{r} 2\frac{28}{25} \\ -\ \frac{20}{25} \\ \hline \end{array}$

43. $\begin{array}{r} \frac{7}{10} \\ +\ \frac{1}{6} \\ \hline \end{array} = \frac{26}{30} = \frac{13}{15}$

44. $\begin{array}{r} \frac{2}{3} \\ -\ \frac{1}{10} \\ \hline \frac{17}{30} \end{array}$

45. $\begin{array}{r} 3\frac{2}{3} \\ +\ 100\frac{5}{12} \\ \hline 103\frac{13}{12}=104\frac{1}{12} \end{array}$

46. $\begin{array}{r} \frac{3}{4} \\ +\ \frac{5}{16} \\ \hline \frac{17}{16}(=1\frac{1}{16}) \end{array}$

47. $\begin{array}{r} \frac{2}{3} \\ -\ \frac{1}{10} \\ \hline \frac{17}{30} \end{array}$

48. $\begin{array}{r} \frac{5}{6} \\ +\ \frac{3}{4} \\ \hline \frac{19}{12}(=1\frac{7}{12}) \end{array}$

49. $\begin{array}{r} \frac{7}{10} \\ +\ \frac{1}{6} \\ \hline \frac{26}{30}=\frac{13}{15} \end{array}$

50. $\begin{array}{r} \frac{5}{8} \\ -\ \frac{1}{3} \\ \hline \frac{7}{24} \end{array}$

51. $\begin{array}{r} \frac{3}{8} \\ -\ \frac{1}{6} \\ \hline \frac{5}{24} \end{array}$

52. $\begin{array}{r} \frac{3}{4} \\ +\ \frac{1}{6} \\ \hline \end{array} = \frac{11}{12}$

53. $\begin{array}{r} \frac{3}{5}=\frac{9}{15} \\ -\ \frac{1}{3}=\frac{5}{15} \\ \hline \frac{4}{15} \end{array}$

54. $\begin{array}{r} \frac{3}{8} \\ +\ \frac{1}{6} \\ \hline \end{array} = \frac{13}{24}$

55. $\begin{array}{r} \frac{7}{10} \\ +\ \frac{1}{6} \\ \hline \frac{26}{30}=\frac{13}{15} \end{array}$

56. $\begin{array}{r} 30\frac{14}{24} \\ -\ 20\frac{9}{24} \\ \hline 10\frac{5}{24} \end{array}$

57. $\begin{array}{r} 5\frac{16}{30} \\ -\ 5\frac{5}{30} \\ \hline \frac{11}{30} \end{array}$

58. $\begin{array}{r} 300\frac{21}{60} \\ +\ 100\frac{4}{60} \\ \hline 400\frac{25}{60}=400\frac{5}{12} \end{array}$

59. $\begin{array}{r} 9\frac{21}{48} \\ -\ 9\frac{12}{48} \\ \hline \frac{9}{48}=\frac{3}{16} \end{array}$

GT Assessment Test

60. 15

61. 12×3 = 36
    2(36 + 9) = 90 ft

62. 36×9 = 324 ft^2

63. 324 = 36×9 = 18×18
    4×18 = 72 ft

64. If a man's hand is 12 inches wide, it would be a foot!!!

65. 19 of them
    11, 22, 33, 44, 55, 66, 77, 88, 99
    101, 111, 121, 131, 141, 151, 161, 171, 181, 191

66. 6 doors remaining open

1st	1	2	3	4	5	6	7	8	9	0	1	2
2nd	1	**2**	3	**4**	5	**6**	7	**8**	9	**0**	1	**2**
3rd	1	**2**	**3**	**4**	5	6	7	**8**	**9**	**0**	1	2

    The door is closed if its number is boldfaced. The doors remain open is 1, 5, 6, 7, 11, and 12.

67. (a) $\frac{8}{15}$
    (b) $\frac{8}{15} \times 300 = 160$

68. B
    G is the 7th alphabet, M is the 13th, U is the 21st, J is the 10th, W is the 23rd.

69. a unit = 3
    length = 3×3 = 9
    width = 2×3 = 6
    9×6 = 54

Assessment Test

70. C

71. B

72. \$6.35 = 19.05÷3

73. C

74. D

75. A

76. D

77. C

78. E
    1, 6, **2**, 7, **3**, 8, **4**

79. C

80. $\frac{1}{8}$

81. C

82. B
    $4\times5 = 20$, $4\times9 = 36$, any amount between 20 and 36 is reasonable.

83. A

84. B

85. 3 adults and 9 children
    $12\times8 = 96$
    $102 - 96 = 6$
    $6\div(10 - 8) = 3$ (adults)

86. D

87. A

88. B
    $4\frac{2}{3}\times3 = 14$

89. E
    $3\times1 + 2\times2 + 3 = 10$