Math Power

August 11, 2019
☎: 301-251-7014
site: http://www.MathEnglish.com

By Dr. Li
E-mail : programs@MathEnglish.com

Name: (First)_____(Last)_____

School: _____ Grade:_____

Math Fascination

1. Tom's math score on midterm is 80. His final score is 10 points higher. What is his average in the two tests?

2. The temperatures in Fahrenheit of three days are 60°, 66°, and 69°. What is the average temperature of the three days?

3. Annie Anteater eats 1,705 ants a day. Alex Anteater eats 1,252 ants and 565 termites a day. How many more ants does Annie eat than Alex each day?

4. At the school carnival, Riva sees a 6-liter jar filled with marbles. Riva finds that 70 marbles can be placed in a 1-liter cup. What would be a good estimate of the total number of marbles in the jar according to Riva?

5. Two numbers have a product of 91. The smaller is 7. What is the difference of the two numbers?

6. What number is 100,000 more than 645,990,831 ?

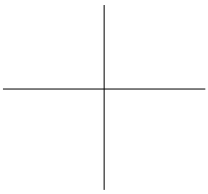
Question set [**7 - 8**]

A rectangle has a length of 25 in and a width of 10 in.

7. What is the perimeter of the rectangle?

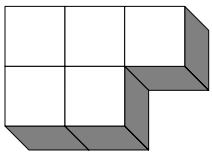
8. What is the area of the rectangle?

9. How many right angles do these perpendicular lines form?



10. Five tightly packed cubic blocks (as the figure shows) are dipped in paint. How many of its faces
    (a) would not be painted?

    (b) would be painted?



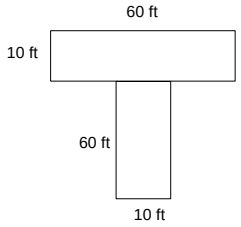
11. What is the smallest prime?

12. 0 is a even whole number. (True or False)

13. 2,500 people pass through the gates of Rocky Hill Amusement Park every hour. How many people pass through in 6 hours?

14. 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 packets are there in a shipment of 4 cartons?

15. A T-shaped parking lot is to be tiled by 1 ft by 1 ft stone tiles. How many pieces will be needed?



16. An average of 12,500 people visit the Great Western Caves every week. How many people visit it in 4 weeks?

17. An average of 350 people visit the Great Western Caves every week. How many people visit it in 4 weeks?

18. Apples cost $2 a pound. A bushel weighs 20 pounds. About how much do the apples cost?

19. Apples cost $2 a pound. A bushel weighs 20 pounds. How much do the apples cost?

20. Ben had two weeks to complete an important assignment. After 3 days, he hadn't started yet. After another week, he still hadn't started. How long did Benn have left to finish his assignment?

21. Big River State Park has had an average of 20,200 visitors per year for the last 7 years. How many visitors has it had in the last 7 years?

Question set [**22 - 26**]

Compare the following decimals.

22. Which is greater, 5.26 or five and three hundredths?

23. Which is lighter, 1.8 kg or one and seven tenths kilograms?

24. Which is shorter, 0.83 m or eighty-nine hundredths of a meter?

25. Which is longer, 0.2 cm or one tenth of a centimeter?

26. Which is heavier, 2.6 kg or two and four tenths kilograms?

27. Dave will turn 21 seven years later. What is his age 3 years ago?

28. Each side of a square is 5 in. What is the perimeter of the square?

29. Eve put 16 magic cups and 12 rope tricks on the shelf. 6 magic cups were already there. How many magic cups are on the shelf now?

Question set [**30 - 33**]

Everything must go.

30. 5 pairs of socks cost $3.50. How much does each pair cost?

31. 3 ears of corn are sold at Giant for $2.50. How much does it cost Teresa to buy 12 ears of corn?

32. 24 is an even number. (True or False)

33. 0 is a positive whole number. (True or False)

Assessment Test

34. 

Which number will be served next?
(A) 

(B) 

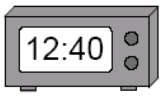
(C) 

(D) 

35. Amy added 249 and 134 on her calculator. Which is a reasonable total?
(A) 121
(B) 251
(C) 383
(D) 593

36. Arnette has surfed the Internet for 6 days. She surfed for about 30 to 45 minutes each day. Which is a reasonable total of minutes she surfed altogether?
(A) 45 mins
(B) 100 mins
(C) 140 mins
(D) 260 mins

37. Katrina bought 7 dresses. Each dress cost between $12 and $18. Which is a reasonable total for the cost of the 7 dresses?
(A) Less than $75
(B) Between $75 and $80
(C) Between $80 and $130
(D) More than $150

38. Aunt Ruth's clock is shown below.


If her niece is going to pick her up in 30 minutes, what time will be shown on the clock?
(A) 12:10
(B) 12:70
(C) 1:10
(B) 1:60

39. Jane has one hour to spend at the mall. She spends 30 minutes trying on clothes and 15 minutes eating. How much time does she have left?
(A) 5 minutes
(B) 15 minutes
(C) 45 minutes
(D) 50 minutes

40. ✱ Mrs. Bee class is going on a field trip to the Science Museum.
    • They will arrive at the museum at 10:00 A.M. and leave at 2:00 P.M.
    • They will have a 30-minute lunch break.
    • They would like to see at least four different exhibits.

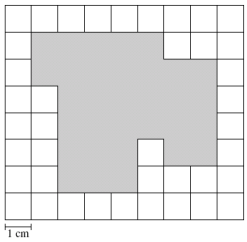
Science Museum Exhibits	Time	Length of Show*
Planetarium	10:00, 12:00; 2:00, 4:00	20 minutes
Laser Show	every hour beginning at 10:00	15 minutes
Electricity	every hour beginning at 10:30	30 minutes
IMAX Theater	11:00, 1:00, 3:00	1 hour
Investigations	10:00, 12:00, 2:00, 4:00	30 minutes
General Programs	10:00 A.M. to 6:00 P.M.	stay as long as you like

*NOTE: Length of show on chart includes travel time from one exhibit to another.

Write a schedule for the class field trip. Include <u>at least</u> <u>4 exhibits</u> the class will visit and the beginning TIME they will see each exhibit. Be sure to include the lunch break in your schedule.

<u>Question set</u> [**41 - 42**]

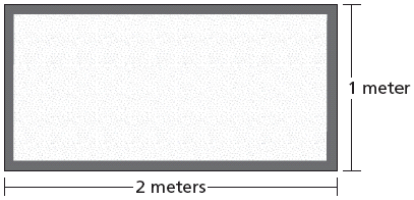
Chester drew the shaded figure on the grid paper shown below.



41. What is the area, in square centimeters, of the shaded figure on the grid above?
    (A) 28
    (B) 30
    (C) 32
    (D) 36

42. Chester drew a rectangle that had the same area as the shaded figure on the grid above. What could be the dimensions (length and width) of the rectangle he drew?
    (A) width = 4 and length = 8
    (B) width = 6 and length = 6
    (C) width = 8 and length = 6
    (D) width = 10 and length = 3

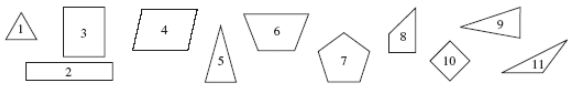
43. Julia is decorating the border of the bulletin board below.



How long, in meters, does the decoration need to be in order to make a border all the way around the bulletin board?

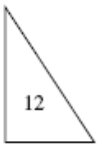
<u>Question set</u> [**44 - 45**]

Peter is separating the figures below into groups according to their properties. There are at least three figures in each group. So far, he has made two different groups.



44. Which of the following has a member placed improperly?
(A) Triangle: 5, 9
(B) Rectangle: 2, 3
(C) Pentagon: 6, 7
(D) trapezoid: 6, 8

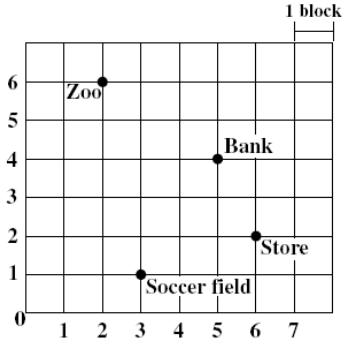
45. Would figure 12 shown below belong to one of the groups above?



(A) equilateral triangle
(B) obtuse triangle
(C) acute triangle
(D) right triangle

Question set [**46 - 49**]

The map below shows the location of some places in Keith's hometown.



46. What ordered pair names the location of the Bank?
(A) (5, 5)
(B) (6, 2)
(C) (5, 4)
(D) (4, 5)

47. What is located at (2, 6)?
(A) Zoo
(B) Soccer field
(C) Store
(D) Bank

48. Moving along the grid lines, the shortest distance from the Store to the Bank is 3 blocks. Moving along the grid lines, what is the shortest distance from the Store to the Zoo?
(A) 10
(B) 9
(C) 8
(D) 7

49. Library is not shown on the map. Moving along the grid lines, the shortest distance from the Library to the Soccer field is 7 blocks. Which ordered pair could name the location of the Library?
(A) (5, 6)
(B) (4, 4)
(C) (3, 2)
(D) (1, 5)

50. There are 157 students in the fourth grade. On the day of a test, 9 students were absent. Each student taking the test was given 2 pencils. What was the total number of pencils given to the students who took the test that day?

51. While riding in a car, Doreen counted 14 blue cars on the highway in 1 minute. At this rate, how many blue cars will she see in 30 minutes?

52. Zachary has a ball of string 6 yards long. He needs 20 feet of string for a project. What should Zachary do first to find out if he has enough string to equal 20 feet?
(A) Multiply 20 by 3
(B) Multiply 20 by 6
(C) Multiply 6 by 3
(D) Multiply 6 by 12

53. Which expression is an example of the associative property of multiplication?
(A) $5 \times (3 \times 2) = (5 \times 3) \times 2$
(B) $5 \times (3 \times 2) = 5 \times (2 \times 3)$
(C) $5 \times (3 \times 2) = 5 \times (2 + 3)$
(D) $5 \times (3 \times 2) = (5 \times 3) + (5 \times 2)$

Equivalent Fractions

Equivalent fractions are fractions that have the same value. Equivalent fractions represent the same part of an object. If we cut a pie into two pieces, one of the pieces is also one half of the pie. If another pie is cut into 4 pieces then two pieces represent the same amount of pie that $\frac{1}{2}$ did. We say that $\frac{1}{2}$ is equivalent to $\frac{2}{4}$.

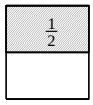
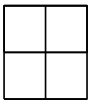
We can determine if fractions are equivalent by multiplying the numerator and denominator by the same number. The number that we multiply should be such that the numerators will be equal after the multiplication. For example if we compare $\frac{1}{2}$ and $\frac{2}{4}$, we would multiply $\frac{1}{2}$ by $\frac{2}{2}$ which would result in $\frac{2}{4}$ so they are equivalent.

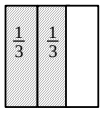
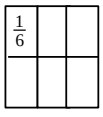
Fractions equivalent to $\frac{1}{2}$ are $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, $\frac{6}{12}$, …

Fractions equivalent to $\frac{1}{3}$, $\frac{2}{6}$, $\frac{3}{9}$, $\frac{4}{12}$, $\frac{5}{15}$, …

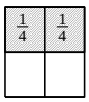
Fractions equivalent to $\frac{1}{4}$ are $\frac{2}{8}$, $\frac{3}{12}$, $\frac{4}{16}$, $\frac{5}{20}$, …

Example A:
Fill in the missing numerator and shade the incomplete diagram so that both sides of the equal sign are equal.

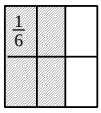
(a)  $\frac{1}{2} = \frac{\quad}{4}$ 

(b)  $\frac{2}{3} = \frac{\quad}{6}$ 

Solution:

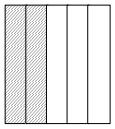
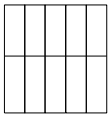


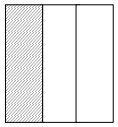
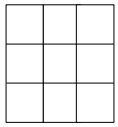
(a)
As you can see, two $\frac{1}{4}$'s make the same as $\frac{1}{2}$, so we can conclude that
$\frac{1}{2} = \frac{2}{4}$

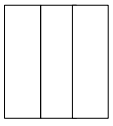
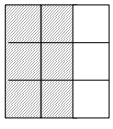


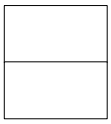
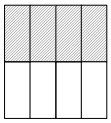
(b)
Four $\frac{1}{6}$'s make the same as $\frac{2}{3}$, we can conclude again.
$\frac{2}{3} = \frac{4}{6}$

Question set [**54 - 57**]
Fill in the missing numerator and shade the incomplete diagram so that both sides of the equal sign are equal.

54.  $\frac{2}{5} = \frac{\quad}{10}$ 

55.  $\frac{1}{3} = \frac{\quad}{9}$ 

56.  $\frac{\quad}{3} = \frac{6}{9}$ 

57.  $\frac{}{2} = \frac{4}{8}$ 

Example B:
Fill in an appropriate number in the place of "?".

(a) $7\frac{1}{2} = \frac{?}{2}$

(b) $\frac{16}{3} = ?\frac{?}{3}$

Solution:

(a) $7\times2 = 14$, $14 + 1 = 15$, so $7\frac{1}{2} = \frac{15}{2}$

(b) $16 \div 3 = 5$ R 1, so $\frac{16}{3} = 5\frac{1}{3}$

Question set [**58 - 59**]
Fill in an appropriate number in the place of "?".

58. $1 = \frac{?}{6}$

59. $2 = 1\frac{?}{5}$

60. $6 = 5\frac{?}{3}$

61. $3 = 2\frac{?}{15}$

62. $\frac{20}{3} = ?\frac{2}{3}$

63. $3\frac{2}{3} = \frac{?}{3}$

64. $3\frac{2}{3} = ?\frac{5}{3}$

65. $12\frac{1}{11} = ?\frac{12}{11}$

66. $12\frac{1}{11} = \frac{?}{11}$

67. $18\frac{1}{3} = 17\frac{?}{15}$

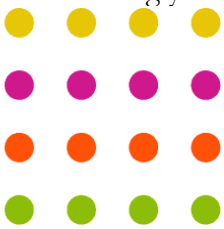
68. $?\frac{1}{3} = 5\frac{16}{12}$

69. $?\frac{1}{3} = \frac{16}{3}$

Math Olympiad

70. A motorist drives through two traffic lights every day. The probability that the motorist has to stop at the first light is 0.3, and at the second, 0.6. The lights are independent of the others. Find the probability that the motorist does not have to stop at these lights.

71. Draw six straight lines through the dots without lifting your pencil or retracing.



72. What number is missing in this sequence? 20, ?, 8, 2, -4, …

73. A person made a purchase for D dollars and C cents and gave the cashier a $20 bill. The cashier incorrectly charged the person C dollars and D cents, and returned $4.88 in change. If the cashier had charged the correct price, what would the correct change have been?

74. Play the strategy game "take two". Place five quarters in a row. With a partner take turns, removing one or two quarters each turn. The person to remove the last quarter is the winner.

(a) Can you find a game strategy so that the first player always win?

(b) Is this a fair game? [In a fair game, each player has an equal chance of winning.]

75. When I open my mathematics book, there are two pages which face me and the product of the two page numbers is 1806. What are the two page numbers?

76. If a fathom is 6 feet, how many fathoms are there in a mile? (Hint: 1 mile = 5280 feet)

77. A full revolution of a minute hand is 360 degrees. How many degrees does the tip of the minute hand move in 25 minutes?

78. What time is the turkey done if it started to cook at 2:50 P.M. and it must cook $1\frac{1}{4}$ hours?

79. A map has a scale of $\frac{1}{4}$ inch equals 10 miles. If two cities are 2 inches apart on the map, how many miles apart are they located?

80. What is the smallest, positive, whole number possible when you rearrange these symbols, using each exactly once?

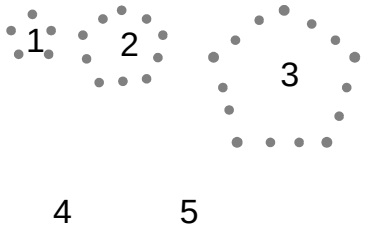
×, -, 9, 2, 4

81. A large box is 150 cm long, 57 cm wide, and 54 cm high. Small boxes are 50 cm long, 19 cm wide, and 18 cm high. How many small boxes will fit inside the large box?

82. What number is represented by the **A** in the problem below?

$$\begin{array}{cccc} & 1 & \mathbf{A} & 5 \\ \times & & 4 & 1 \\ \hline 5 & 1 & 2 & 5 \end{array}$$

83. The following pattern shows 3 groups of pentagons. The first one takes 5 dots. How many dots do the next two pentagons (numbered 4 and 5) take?



Solving Long Problems

84. Wendy's cat Sugar had 6 kittens. All the kittens were female. Each of Sugar's kittens had kittens, too. Each had 6 females and 2 males. How many "grandchildren" did Sugar have all together?

85. Roy is in charge of buying candy for the class party. At the store, he finds 3 kinds on sale: chocolate drops at $2.50 a package, mint chews at $3.00 for 2 packages, and caramels at $1.50 a package. A package of chocolate drops contains 16 ounces. A package of mint chews contains 24 ounces, and a package of caramels contains 14 ounces. Which candy is the best buy?

86. Sumi moved to the United States with her parents in 1994. when she was 2 years old. The family moved to Iowa 2 years later. After living in Iowa for 3 years, the family moved to Virginia. In the year 2000, they moved to Florida. How old was Sumi when her family moved to Florida?

87. The Wesleys decided to donate all 80 of their paperbacks to two neighborhood used-book sales. On Saturday morning, they took half the books to the first sale and bought 16 books while they were there. On Saturday afternoon, they took half the remaining books they had planned to donate to the second sale, leaving the other half behind by accident. At that sale, they bought 23 books. How many paperbacks did they have at the end of the day?

88. The Ames Retirement Home invited 4 third-grade classes to display their art projects in the dining room. The room is 45 feet wide and 60 feet long and has no windows. There are 2 doors into the room, each with an opening 6 feet wide. The art must be placed in a 3-foot high strip of space along the walls. What is the total length of the display space the children will be able to use?

Answer Key

Math Fascination

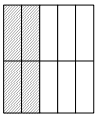
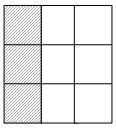
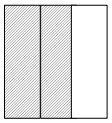
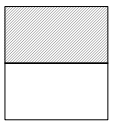
1. $\frac{1}{2}(80 + 90) = 85$
2. 60+66+69 = 195
   195÷3 = 65
3. 1705 - 1252 = 453
4. 70×6 = 420 marbles
5. 91÷7 = 13
   13 - 7 = 6
6. 646,090,831
7. 2(25 + 10) = 70 in
8. 25×10 = 250 in^2
9. 4
10. (a) 5×2 = 10
    (b) 5×6 - 10 = 20
11. 2 (not 1)
12. True
13. 2,500×6 = 15,000
14. 4×20 = 80
15. 60×10×2 = 1200
16. 12,500×4 = 50,000
17. 4×350 = 1400
18. 20×2 = $40
19. 20×2 = $40
20. 14 - 3 - 7 = 4 days
21. 20,200×7 = 141,400
22. 5.26 > 5.03
23. 1.8 > 1.7
24. 0.83 < 0.89
25. 0.2 > 0.1
26. 2.6 > 2.4
27. 21 - 7 - 3 = 11 yrs old
28. 5×4 = 20 (in)
29. 16+6 = 22 (cups)
30. 3.5÷5 = $0.70
31. 12 ÷3 = 4
    4 ×2.5 = 10
32. True
33. False
    0 is a whole number, but it is not positive.

Assessment Test

34. D
35. C
36. D
37. C
38. C
39. B
40. Investigations: 10:00 - 10:30
    Electricity: 10:30 - 11:00
    IMAX Theater: 11:00 - 12:00
    Lunch: 12:00 - 12:30
    Laser Show: 1:00 - 1:15
    General Programs: 1:15 - 2:00
41. C
    3×4 = 12
    3×6 = 18
    12 + 18 + 2 = 32
42. A
43. 6 (m)
    2 + 1 = 3
    2×3 = 6
44. C
    [6] is a trapezoid, not a pentagon.
45. D
46. C
47. A
48. C
49. A

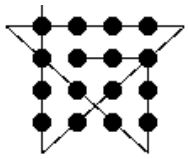
50. 296 (pencils)
    157 - 9 = 148
    2×148 = 296
51. 420
52. C
53. A

Equivalent Fractions

54. $\frac{2}{5} = \frac{4}{10}$ 
55. $\frac{1}{3} = \frac{3}{9}$ 
56.  $\frac{2}{3} = \frac{6}{9}$
57.  $\frac{1}{2} = \frac{4}{8}$
58. $1 = \frac{6}{6}$
59. $2 = 1\frac{5}{5}$
60. $6 = 5\frac{3}{3}$
61. $3 = 2\frac{15}{15}$
62. $\frac{20}{3} = 6\frac{2}{3}$
63. $3\frac{2}{3} = \frac{11}{3}$
64. $3\frac{2}{3} = 2\frac{5}{3}$
65. $12\frac{1}{11} = 11\frac{12}{11}$
66. $12\frac{1}{11} = \frac{133}{11}$
67. $18\frac{1}{3} = 17\frac{20}{15}$
68. $6\frac{1}{3} = 5\frac{16}{12}$
69. $5\frac{1}{3} = \frac{16}{12}$

Math Olympiad

70. 1 - 0.3 = 0.7 (non-stop at the first light)
    1 - 0.6 = 0.4 (non-stop at the second light)
    0.4×0.7 = 0.28
71. See the following diagram.



72. 20 - 6 = 14
    14 - 6 = 8
    8 - 6 = 2
    2 - 6 = -4
73. 20 - 4.88 = 15.12
    20 - 12.15 = $7.85
74. (a) If the first one starts to take two, then he will win for sure.
    (b) No, it is not a fair game.
75. p. 42 and p. 43
    42×43 = 1806
    47×48 = 2256
76. 5280÷6 = 880 fathoms
77. 360÷60 = 6
    6×25 = 150 degrees
78. 2:50 + 1:15 = 4:05 P.M.
79. $2 \div \frac{1}{4} = 8$
    8×10 = 80 mi
80. 9 - 2×4 = 1
81. 150÷50 = 3
    57÷19= 3
    54÷18 = 3
    3×3×3 = 27 boxes
82. A = 2
83. 5, 10, 15, 20, 25
    20 + 25 = 45

Solving Long Problems

84. 6 × 6 = 36 granddaughters
    6 × 2 = 12 grandsons
    36 + 12 = 48 grandchildren

85. Mint chews
    Chocolate drops $2.50 ÷ 16 = $.16 per ounce
    Mint chews $3.00 ÷ 48 (or $1.50 ÷ 24) = $.06 per ounce
    Caramels $1.50 ÷ 14 = $.11 per ounce
    Mint chews are the best buy.

86. 1994 - 2 = 1992 (year Sumi was born)
    2000 - 1992 = 8 years old

87. Donated 40, purchased 16.
    Donated 20; purchased 23.
    20 (never donated) + 16 + 23 = 59 books

88. 45 + 45 = 90
    60 + 60 = 120:90 + 120 = 210 feet
    210 - 12 (width of 2 doors) = 198 feet