Math Power

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Operations on Fractions

1. $\frac{100}{9} \times \frac{81}{10} =$

2. $6 \times \frac{4}{30} =$

3. $21 \times \frac{1}{3} =$

4. $\frac{1}{2} \times 24 =$

5. $\frac{1}{9} \div \frac{2}{3} =$

6. $\frac{3}{10} \div 1\frac{2}{5} =$

7. $\begin{array}{r} 2 \\ -\ \frac{3}{11} \\ \hline \end{array}$

8. $\begin{array}{r} 2 \\ +\ \frac{1}{5} \\ \hline \end{array} =$

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

10. $\begin{array}{r} 4\frac{1}{7} \\ -\ 2\frac{5}{7} \\ \hline \end{array} =$

11. $\frac{2}{5} \times \frac{1}{6} =$

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12. $12 \times \frac{5}{36} \times 6 =$

13. $\frac{7}{10} \times \frac{3}{14} \times \frac{1}{5} =$

14. $\frac{1}{20} \times \frac{21}{8} \times 4 =$

15. $\frac{1}{9} \div \frac{2}{3} =$

16. $\begin{array}{r} 10\frac{1}{6} \\ 5\frac{1}{2} \\ +\quad 3\frac{3}{4} \\ \hline \end{array} =$

17. $\begin{array}{r} \frac{17}{18} \\ \frac{1}{2} \\ +\quad \frac{5}{6} \\ \hline \end{array} =$

18. $\begin{array}{r} 30\frac{1}{15} \\ 10\frac{1}{3} \\ +\quad 20\frac{3}{5} \\ \hline \end{array} =$

19. $\frac{50}{7} \times \frac{11}{10} \times 2 =$

20. $12 \times \frac{1}{30} \times \frac{5}{9} =$

21. $\frac{10}{3} \times 15 \times \frac{1}{31} =$

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M6

Math Intuition

22. 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?

Question set [**24 - 25**]

A binder cost $4 in Office Depot. Ken paid $20 for 4 mechanical pencils and 3 binders.

23. What is the price of a mechanical pencil?

24. How much would Ken pay if he changed his mind and decided to buy 4 binders and 3 mechanical pencils instead?

25. Find the sum of whole numbers from 1 to 20.

26. Carl has $6 more than Dave. They put together their money to buy a video game, which costs $30. How much money do they contribute individually?

27. What value of k makes the following equation true?

$k \div 3 = 36$

28. Which is an irrational number?

(A) $\sqrt{5}$
(B) $\sqrt{9}$
(C) -1
(D) $-\frac{2}{3}$

29. How many digits must be used to number a book of 60 pages?

(A) 108
(B) 109
(C) 110
(D) 111

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30. N is a whole number and N + 3 is an odd number. Decide each of the following if it is odd or even.
(a) 3×N + 1

(b) 3×N - 1

(c) 2×N

(d) N + 6

(e) 2×N + 5

31. What is the value of *N* in the following equation:
13 hundreds + *N* tens + 17 ones = 1497?
(A) 11
(B) 18
(C) 20
(D) 21

32. The diagram shows a magic square in which the sums of the numbers in any row, column or diagonal are equal. What is the value of *n*?

8		
9		5
4	*n*	

(A) 3
(B) 6
(C) 10
(D) 11

33. The digits in the number "1998" are each cycled separately and then numbered as shown.
1. 9981
2. 9819
3. 8199
…
If the pattern continues in this way, what number will appear in front of 1998?
(A) 3
(B) 5
(C) 10
(D) 16

34. A sum of $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{7}$ of a number is 2 less than that number. Find that number.

35. A group of 11 boys and girls altogether went on a field trip. If the number of girls triples, then there would be more girls than the boys. On the other hand, if the number of boys doubles, than the number of boys would be larger than five-fold the number of girls. How many girls and boys were there on the field trip?

36. Gina and Henna are working for a fast food restaurant. Gina works every other day. Henna works on the first day of every three days. If Gina sees Henna on Tuesday, what day will Gina see Henna next time?

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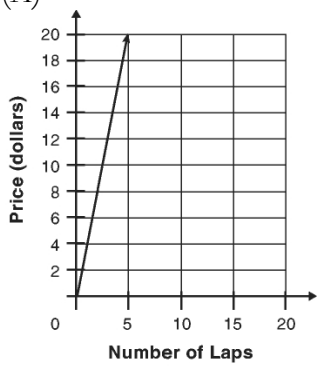
37. The table below shows the charges for renting and racing a go-cart.

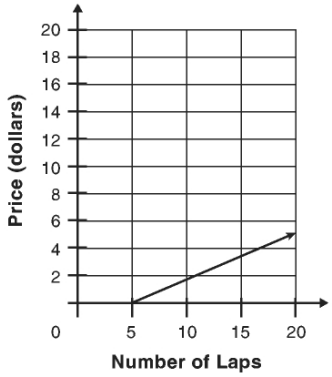
Number of Laps	0	1	2	3	4	5
Price (dollars)	5	8	11	14	17	20

Which graph best represents these prices?

(A)



(B)



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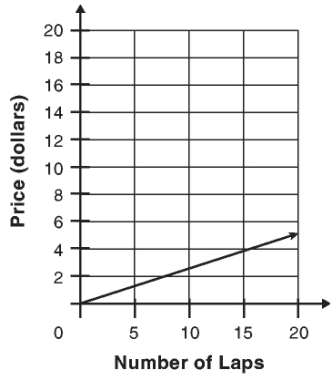
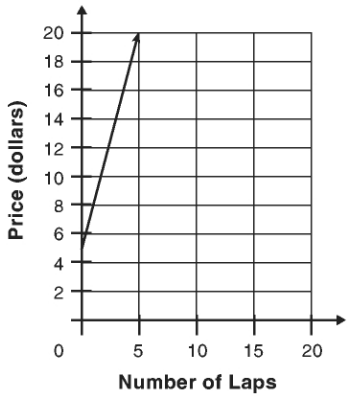
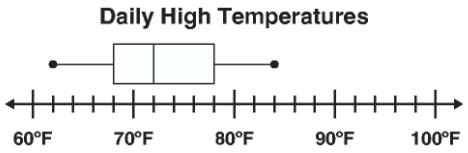


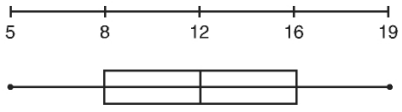
(D)



38. The box-and-whisker plot below represents the daily high temperatures at a beach in April. What was the median daily high temperature?



39. The following data represent the number of years different students in a certain group have gone to school together: 12, 5, 8, 16, 15, 9, 19. These data are shown on the box-and-whisker plot below. What is the median of the data?



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40. $(\frac{3}{2})^3 =$

41. Find the value for the ☐:
$5^6 \div 5^2 = 25^{\square}$

42. $\sqrt{1.21} =$

43. $\sqrt{\frac{4}{9}} =$

44. $\sqrt{\frac{81}{196}} =$

45. Donna took 3 baseball cards to school on Monday. Every day that week she took twice as many baseball cards as the day before. How many baseball cards did Donna take to school on Friday?

46. $.5^2 =$

47. $100 \times \sqrt{\frac{16}{25}} =$

Question set [**49 - 52**]
Frog Leapy practices leaping for the annual contest. He can make 15 leaps in a minute.

48. How many leaps can he make in 20 sec?

49. How many leaps can he make in 24 sec?

50. How many leaps can he make in 40 sec?

51. How many leaps can he make in 72 sec?

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Question set [**53 - 58**]

Parts and fraction.

52. Mrs. Robin's class had $\frac{1}{4}$ of students absent for flu and there were only 18 students present today.
(a) How many students were absent today?

(b) How many students did Mrs. Robin have for her class?

53. Peter lost $\frac{1}{5}$ of his baseball cards. He had only 120 cards left.
(a) How many cards were lost?

(b) How many cards did he have before?

54. Jenny spent $\frac{1}{6}$ of her allowance on a book sale. She had $20.00 left.
(a) How much money was spent?

(b) How much money did she have before spending?

55. Sherry was on a hiking trip along a trail. After walking 3 miles, she took a rest. She still had $\frac{7}{8}$ of the trail to finish.
(a) How many miles left unfinished?

(b) What was the total distance of the trip?

56. Susie saved $200.00, only $\frac{4}{5}$ of the price of a stereo set she liked.
(a) How much more did she need?

(b) What was the price of the stereo set?

57. Tammy saved $400. The price of an MP3 player is 60% of what she has.
(a) What is the price of the MP3 player?

(b) How much did she have left after the purchase?

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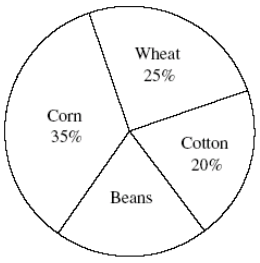
Assessment Test

Question set [**59 - 61**]

Mr. Riley grows four different crops on his 300-acre farm. Each acre has the same number of plants. The circle graph below shows what percent of the total number of acres is planted in each crop.

Crops Planted on Mr. Riley's Farm



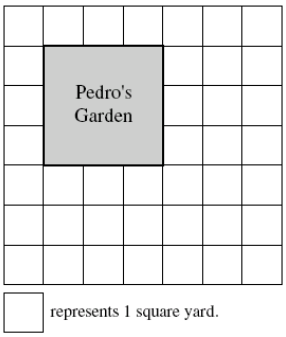
58. What percent of Mr. Riley's farm is planted in beans?

59. How many acres of wheat are planted in Mr. Riley's farm?

60. Mr. Riley thinks that if he plants wheat in all of the acres that are beans, more than half his farm would be wheat. Is he correct? Why or why not?

Question set [**62 - 64**]

In the grid below, each square represents one square yard of land. Twenty carrot plants can fit in one square yard of land.



61. How many square yards are in Pedro's garden? How many plants can fit in Pedro's garden?

62. How many yards of fencing does Pedro need to enclose his garden?

63. Sean encloses a rectangular garden with 16 yards of fencing. Is it possible that Pedro's garden can contain more plants than Sean's garden?

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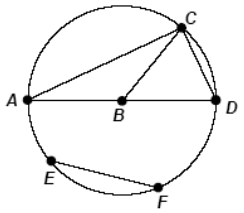
64. 4.05 - 2.01 =
(A) 1.14
(B) 1.94
(C) 2.04
(D) 2.94

65. Use mental math to find the product.
33× 20=
(A) 520
(B) 530
(C) 620
(D) 660

66. If $a = 8$, evaluate the expression $a + 4$.
(A) 4 + 4 = 8
(B) 8 + 4 = 12
(C) 4 - 8 = 2
(D) 8 - 4 = 4

67. Tonia has 5 quarters, Darell has 8 dimes, Steven has 10 pennies, and Latoya has 20 nickels. Who has the most money?
(A) Steven
(B) Darell
(C) Tonia
(D) Latoya

68. Which segment identifies the circle's diameter?



(A) AC
(B) AD
(C) BC
(D) EF

69. Carla's Candies has been in business since 1990. The line graph below shows the store's sales for the past eight years.

Assuming the trend continues, what do you predict the sales to be in the ninth year?
(A) $300,000
(B) $325,000
(C) $350,000
(D) $400,000

70. What is the perimeter of a square room having the area of 625 square feet?
(A) 100 ft
(B) 130 ft
(C) 175 ft
(D) 238 ft

71. Mary Jo bought 3 rolls of wrapping paper and 2 boxes of bows. The wrapping paper costs $2.75 a roll, and the bows cost $5.00 a box. How much money did she spend? Which two operations do you need to use to solve this problem?
(A) ÷, +
(B) -, ×
(C) ×, +
(D) ÷, -

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72. Which of the following choices correctly describes the number 15?
(A) even and prime
(B) odd and composite
(C) even and composite
(D) odd and prime

73. Which set of numbers is written from least to greatest?
(A) $\frac{1}{2}$, $\frac{2}{3}$, .45,.050
().45,.050, $\frac{1}{2}$, $\frac{2}{3}$
(C).050,.45, $\frac{1}{2}$, $\frac{2}{3}$
(D) $\frac{1}{2}$, $\frac{2}{3}$,.050,.45

74. Pedro had $9.00. He spent $4.53 of his money. How much did Pedro have left?
(A) $4.43
(B) $4.47
(C) $5.53
(D) $5.57

75. Solve the problem.
$7\times0 \times 4 = \square$
(A) 0
(B) 4
(C) 11
(D) 28

76. Ahmad is trying to visit all 50 states. In 1995 he visited 2 states, in 1996 he visited 3 more states, in 1997 he visited 4 more states, and in 1998 he visited 5 more states. If he continues this pattern, in what year will he visit the 50th state?
(A) 2001
(B) 2003
(C) 2005
(D) 2007

77. Fabric is measured in units called bolts. One bolt is equal to 40 yards. How many inches of cloth are there in a bolt?
(A) 40 inches
(B) 120 inches
(C) 960 inches
(D) 1,440 inches

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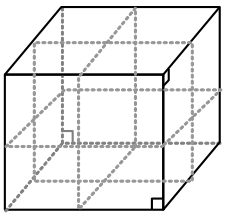
Math Olympia

78. $\frac{1}{\frac{1}{2}+\frac{1}{3}}$ =
(A) $\frac{5}{6}$
(B) $\frac{6}{5}$
(C) 6
(D) 5

79. What is the largest prime factor of $2^2+3^2+5^2$?
(A) 5
(B) 13
(C) 19
(D) 37

80. How many different cubes can you make if each face of a given cube has a line connecting the center points of two opposite edges?



81. If I save $1 on odd-numbered days every month, and $2 on even-numbered days, how much will I save in the year 2000?
(A) $16
(B) $538
(C) $545
(D) $549

82. Indy Anna-Jones is faced with a crucial situation. If she is to escape the cave in to which she has been thrown by the Never of Woz, she has to put the right number of rocks into the circular depressions that are in a straight line in the ground in front of her. Each depression has to have 1 to 15 rocks. No number of rocks may be used more than once. Neighboring rocks must add to give a square number. Can Indy Anna-Jones escape? (Hint: the first number is 9.)

83. 111 + 222 + 333 + 444 = 222×□?
(A) 1
(B) 4
(C) 5
(D) 10

84. Tom interviewed 50 students. 41 said they like peanut butter sandwiches, 35 liked jam sandwiches and 30 liked both on their sandwiches. How many students liked neither?

85. What is the area of square whose diagonal is 12 in?

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Answer Key

Operations on Fractions

1. $\frac{100}{9} \times \frac{81}{10} = 90$

2. $6 \times \frac{4}{30} = \frac{4}{5}$

3. $21 \times \frac{1}{3} = 7$

4. $\frac{1}{2} \times 24 = 12$

5. $\frac{1}{6}$

6. $\frac{3}{14}$

7. $2 - \frac{3}{11} = 1\frac{8}{11}$

8. $2 + \frac{1}{5} = 2\frac{1}{5}$

9. $3 - \frac{5}{9} = 2\frac{4}{9}$

10. $4\frac{1}{7} - 2\frac{5}{7} = 1\frac{3}{7}$

11. $\frac{2}{5} \times \frac{1}{6} = \frac{1}{15}$

12. $12 \times \frac{5}{36} \times 6 = 10$

13. $\frac{7}{10} \times \frac{3}{14} \times \frac{1}{5} = \frac{3}{100}$

14. $\frac{1}{20} \times \frac{21}{8} \times 4 = \frac{21}{40}$

15. $\frac{1}{6}$

16. $10\frac{1}{6} + 5\frac{1}{2} + 3\frac{3}{4} = 18\frac{17}{12} = 19\frac{5}{12}$; $10\frac{2}{12} + 5\frac{6}{12} + 3\frac{9}{12}$

17. $\frac{17}{18} + \frac{1}{2} + \frac{5}{6} = \frac{41}{18} = 2\frac{5}{18}$; $\frac{17}{18} + \frac{9}{18} + \frac{15}{18}$

18. $30\frac{1}{15} + 10\frac{1}{3} + 20\frac{3}{5} = 60\frac{15}{15} = 61$; $30\frac{1}{15} + 10\frac{5}{15} + 20\frac{9}{15}$

19. $\frac{50}{7} \times \frac{11}{10} \times 2 = \frac{110}{7}$

20. $12 \times \frac{1}{30} \times \frac{5}{9} = \frac{2}{9}$

21. $\frac{10}{3} \times 15 \times \frac{1}{31} = \frac{50}{31}$

Math Intuition

22. $\frac{7.2 - 0.3 \times 12}{4} = \frac{3.6}{4} = \$0.90$

23. 3×4 = 12 (binders cost)
    20 - 12 = 8 (pencils cost)
    8÷4 = $2.00 (each pencil)

24. 4×4 + 3×2 = $22

25. 1+2+3+…+20 = $\frac{1}{2} \times 20 \times (20+1) = 210$

26. (30+6)÷2 = $18.00 (Carl)
    (30-6)÷2 = $12.00 (Dave)

27. 108

28. A

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29. D

Page	Digits
1 - 9	9×1 = 9
10 - 60	51×2 = 102

9 + 102 = 111 digits

30. N + 3 is odd, then N is even.
(a) odd
(b) odd
(c) even
(d) even
(e) odd

31. B
1300 + 17 = 1317
1497 - 1317 = 180
N = 18

32. D
8 + 9 + 4 = 21
See the steps below.

21 - (9 + 5) = 7

8		
9	7	5
4	*n*	

21 - (4 + 7) = 10

8		10
9	7	5
4	*n*	

21 - (8 + 10) = 3

8	3	10
9	7	5
4	*n*	

21 - (3 + 7) = 11

8	3	10
9	7	5
4	11	

33. D
"1998" has four digits. It will repeat itself every 4 times. Any number divisible by 4 will be fine.

34. $\frac{1}{2} + \frac{1}{3} + \frac{1}{7} = \frac{21+14+6}{42} = \frac{41}{42}$
$1 - \frac{41}{42} = \frac{1}{42}$
$2 \div \frac{1}{42} = 84$

35. Try and error: 1 girl and 10 boys, 2 girls and 9 boys, etc.
It will work only when there are 3 girls and 8 boys.

36. The LCM of 2 and 3 is 6, which means they will meet each other every 6 days. So, the earliest day they are going to meet is next Monday.

37. D

38. 72° F

39. 12

40. $\frac{27}{8}$ or $3\frac{3}{8}$

41. $5^6 \div 5^2 = 25^2$

42. 1.1

43. $\frac{2}{3}$

44. $\frac{9}{14}$

45. Mon: 3
Tue: 6
Wed: 12
Thu: 24
Fri: 48 cards

46. $.5^2 = .25$

47. $100 \times \sqrt{\frac{16}{25}} = 100 \times \frac{4}{5} = 80$

48. $\frac{20}{60} \times 15 = \frac{1}{3} \times 15 = 5$ leaps

49. $\frac{24}{60} \times 15 = \frac{2}{5} \times 15 = 6$ leaps

50. $\frac{40}{60} \times 15 = \frac{2}{3} \times 15 = 10$ leaps

51. $1\frac{12}{60} \times 15 = 1\frac{1}{5} \times 15 = 15 + 3 = 18$ leaps

52. (a) $\frac{1}{3} \times 18 = 6$
(b) $18 \div \frac{3}{4} = 24$ or $18 + 6 = 24$

53. (a) $\frac{1}{4} \times 120 = 30$
(b) $120 \div \frac{4}{5} = 150$, or $120 + 30 = 150$

54. (a) $\frac{1}{5} \times 20 = \$4.00$
(b) $20 \div \frac{5}{6} = 24$ or $20 + 4 = \$24$

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55. (a) 3×7 = 21 mi
    (b) $3 \div \frac{1}{8}$ = 24 or 21 + 3 = 24 mi

56. (a) $200 \times \frac{1}{4}$ $50
    (b) $200 \div \frac{4}{5}$ = 250 or 200 + 50 = $250

57. (a) 400×0.6 = $240
    (b) 400×0.4 = 160 or 400 - 160 = $160

Assessment Test

58. 20%
    100% - (25% + 35% + 20%) = 20%

59. 75 acres
    25%×300 = 75

60. No
    Wheat = 25%
    Bean = 20%
    25% + 20% = 45% < 50%

61. 180 (carrots)
    3×3 = 9
    9×20 = 180

62. 12 (yards) = 3×4

63. It is possible. For instance if Sean's garden is 1×7 yd, then the garden has an area of 7 sq. yd, resulting in smaller area.

64. C

65. D

66. B

67. C

68. B

69. C

70. A

71. C

72. B

73. C

74. B

75. A

76. B

77. D

Math Olympia

78. B
    $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$
    $1/\frac{5}{6} = \frac{6}{5}$

79. C
    4 + 9 + 25 = 38 = 2×19

80. $2^3 = 8$

81. D
    366×1.5 = 183×3 = 549

82. 9, 7, 2, 14, 11, 5, 4, 12, 13, 3, 6, 10, 15, 1, and 8.

83. C
    1 + 2 + 3 + 4 = 10
    10 = 2×**5**

84. 35 - 30 = 5 (jam only)
    41 - 30 = 11 (peanut butter only)
    50 - (5+11+30) = 4 (neither)

85. $\frac{1}{2}(12 \times 12) = 6 \times 12 = 72$ in^2

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