22. Charlie grills 3 hot dogs for every 8 hamburgers he grills. If he grills 48 hamburgers, that is 6 groups of 8 burgers. So he grills $6 \times 3 = 18$ hot dogs.

    A) 18   B) 43   C) 80   D) 128

    22.
    A

23. Today is my birthday. My age in months is 12 times my age in years and is also 99 greater. Since $9 \times 12 = 108$ and $9 + 99 = 108$, I am 9 years old.

    A) 9   B) 11   C) 12   D) 14

    23.
    A

24. If a radius of a circle is half the length of a side of a square, a diameter is equal to the length of one side. The perimeter is 4 times the diameter.

    A) 2   B) 4   C) 8   D) 16

    24.
    B

25. The remainder upon division by 8 is shown next to each answer choice. Of the remainders shown, only 2 is a prime. (1 is not prime.)

    A) 548 R4   B) 569 R1   C) 678 R6   D) 778 R2

    25.
    D

26. My aunt can fold 4 paper cranes in 1 minute. My uncle can fold 3 paper cranes in 1 minute. Together they fold 7 paper cranes in 1 minute. It takes them $42 \div 7 = 6$ minutes to fold 42 paper cranes.

    A) 6 minutes   B) 9 minutes   C) 12 minutes   D) 13 minutes

    26.
    A

27. The second sum replaces 1 with 101, so the total is $2500 + 100 = 2600$.

    A) 2500   B) 2600   C) 2601   D) 2700

    27.
    B

28. Work backwards. Alfonse's rat is $6 \times 4 = 24$ mm tall. His cat is $8 \times 24 = 192$ mm tall. His high chair is $10 \times 192 = 1920$ mm tall.
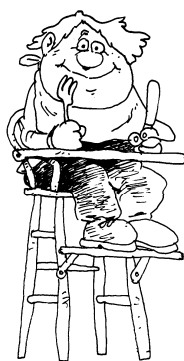
    A) 28 mm   B) 480 mm   C) 960 mm   D) 1920 mm

    28.
    D

29. If Ray ran for the first time last month on a Monday, then he ran on Wed., Fri., Sun., Tues., Thurs., Sat., Mon., Wed., and Fri. The tenth day was a Friday.
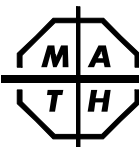
    A) Monday   B) Tuesday   C) Friday   D) Sunday

    29.
    C

30. Add 10 to 1, 3, 5, 7, . . . , 87, and 89. None of these sums is more than 99. There are 45 such sums.

    A) 45   B) 46   C) 90   D) 91

    30.
    A

The end of the contest ✍🕯 **4**

Information & Solutions

Spring, 2013

4

Directions for Grading

- **Date** You may give this contest any time after April 15. The *4th Grade Contest* is for use in your own school or district. We've enclosed a registration form for next year. Instructions for optionally submitting results are included on a separate sheet entitled "*Using the Score Report Center.*"

- **Urgent questions?** Write to comments@mathleague.com, or call 1-201-568-6328.

- **Scores** Remind students that *this is a contest, and not a test*—there is no "passing" or "failing" score. Few students score as high as 24 points (80% correct); students with half that, 12 points, *should be commended!*

- **Solutions** Detailed solutions appear in each question box, and letter answers are in the *Answers* columns on the right. You may copy this solution key and give a copy to every student who took this contest.

- **Awards** The original contest package contained 1 book award (and a bookplate you should affix to the book's inside front cover) for the 1st place student. We also enclosed 5 *Certificates of Merit*—1 for each runner-up, plus extras for ties.

- **Additional Book Awards & Additional Certificates** If you want to give more than 1 book award, you may purchase additional books as described below. Do you need more Certificates of Merit? If so, send your name, school, and school mailing address to our mailer at: **Math Certificates, P.O. Box 17, Tenafly, NJ 07670**, and *include a self-addressed, stamped envelope (**2 stamps required**) large enough to hold certificates.*

  The school's top scorer will receive the book *Math Contests—Grades 4,5,6 (Vol. 4)*. Other high scorers will receive Certificates of Merit. In any one school year, no student may win both a book and a certificate. The book and certificates were in the original contest package. Special "bumper sticker" awards are included for high-scoring students.

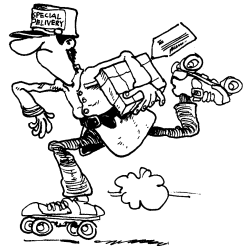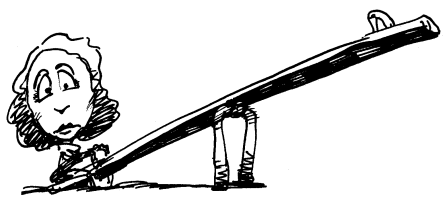 *If needed, duplicate book awards may be ordered as described below.*

1. The product of a number multiplied by 0 is 0.

    A) 0   B) 6   C) 12   D) 2013

    1. A

2. Rollo delivers 3 packages to each of the 4 houses on Sixth Street. Rollo delivers a total of $3 \times 4 = 12$ packages.

    A) 7   B) 12   C) 13   D) 72

    2. B

3. Since $16 \div 4$ has remainder 0, the remainder is $0 + 0 + 0 + 0 = 0$.

    A) 16   B) 4   C) 2   D) 0

    3. D

4. Since $380 = 10 \times 38$, 10 is a factor of 380.

    A) 3   B) 6   C) 8   D) 10

    4. D

5. There are $80 \times 8 = 640$ pencils in 80 boxes.

    A) 10   B) 88   C) 640   D) 808

    5. C

6. $(60 \div 5) \times 4 = 12 \times 4 = 48$.

    A) 3   B) 16   C) 48   D) 96

    6. C

7. Stan earns 20¢ for every glass of lemonade he sells. Stan earns $20, which is 2000¢, so he sells 2000¢ ÷ 20¢ = 100 glasses of lemonade.

    A) 10   B) 20   C) 40   D) 100

    7. D

8. There are 60 whole numbers from 0 to 59. That's 50 without 0 to 9.

    A) 49   B) 50   C) 51   D) 59

    8. B

9. Seventeen days is the same as 14 days + 3 days. Since 14 days is two weeks, Seth will be back 3 days after Saturday. He will be back on Tuesday.

    A) Sunday   B) Tuesday
    C) Thursday   D) Friday

    9. B

10. The smallest even factor is 2; $30 \div 2 = 15$, the greatest odd factor.

    A) 5   B) 6   C) 15   D) 21

    10. C

11. Wayne goes to bed exactly 65 minutes after 8:30 P.M. Since 65 minutes = 1 hour + 5 minutes, Wayne will go to bed at 9:35 P.M.

    A) 9:05 P.M.   B) 9:25 P.M.   C) 9:35 P.M.   D) 9:45 P.M.

    11. C

12. Roy has rowed his rowboat 1000 m from where he started. Since 1 m = 100 cm, Roy rowed $1000 \times 100 = 100\,000$ cm.

    A) 10   B) 100
    C) 10 000   D) 100 000

    12. D

13. My pocketful of coins includes quarters, dimes, nickels, and exactly 8 pennies. Since 8 pennies is 3 more than 5¢, my amount of money must end with a 3 or an 8.

    A) $14.56   B) $16.32   C) $18.85   D) $21.93

    13. D

14. $(4 \times 20) \times (4 \times 20) = 80 \times 80$.

    A) 80   B) 20   C) 4   D) 2

    14. A

15. If the sum of the lengths of the sides of a rhombus is 24, then each side of the rhombus has a length of $24 \div 4 = 6$.

    A) 3   B) 4   C) 6   D) 8

    15. C

16. If 20 years ago Allen was half as old as he is today, then today he is 40. Thus, 10 years ago he was 30.

    A) 20   B) 30   C) 40   D) 50

    16. B

17. If the sum of 7 whole numbers is even, there must be an even number of odd numbers. The total number of odd numbers could be 6.

    A) 6   B) 4   C) 3   D) 1

    17. A

18. (10 hundreds) + (10 ones) = 1000 + 10 = 1010 = 101 tens.

    A) 10   B) 101   C) 110   D) 1010

    18. B

19. Sam prepares a plate of spaghetti with so many meatballs that the number of meatballs is divisible by 4, 5, 6, 7, and 8. The lcm of 4, 5, 6, 7, and 8 is $4 \times 5 \times 3 \times 7 \times 2 = 840$.

    A) 210   B) 420   C) 840   D) 6720

    19. C

20. The number that is 50 less than 125 is 75. The number that is 25 less than 75 is 50.

    A) 0   B) 25   C) 50   D) 75

    20. C

21. The product of 2 odd numbers, such as $5 \times 7 = 35$, is always odd.

    A) divisible by 3   B) odd   C) prime   D) even

    21. B