22. Maria had 28 dreams last month, 24 of which involved animals. Since $16 + 15 = 31$ involved moneys or squirrels, then at least $31 - 24 = 7$ dreams involved both monkeys and squirrels.

    A) 3 B) 7 C) 9 D) 11

    22. B

23. A trapezoid may have consecutive sides of lengths 3, 3, 8, and 4.

    A) triangle B) square
    C) parallelogram D) trapezoid

    23. D

24. My pennies can be divided into $500 \div 6 = 83$ groups of 6 pennies, with 2 left over. At the end of the 82nd day, I will have $6 + 2 = 8$ pennies left.

    A) 6 B) 8 C) 10 D) 12

    24. B

25. A fair sells a "combo" ticket for $30 entry and a "per ride" ticket for $12.50 to enter plus $5 per ride. A "per ride" ticket costs $12.50 + \$15 = \$27.50$ for 3 rides and $12.50 + \$20 = \$32.50$ for 4 rides.

    A) 3 B) 4 C) 6 D) 7

    25. B

26. Since $5 \times 4 = 20$, the ones digit of the given product must be 0.

    A) 0 B) 4 C) 6 D) 9

    26. A

27. A team scores an average of 31 points per game in its 1st 4 games for a total of $31 \times 4 = 124$ points, and an average of 30 points per game in its 1st 5 games for a total of $30 \times 5 = 150$ points. The difference is $150 - 124 = 26$.
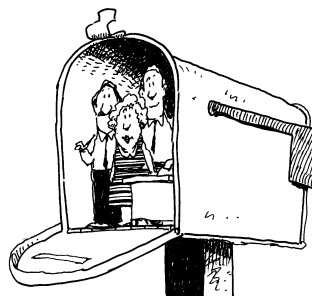
    A) 26 B) 27 C) 28 D) 29

    27. A

28. The possibilities are 1) XOXOXOO, 2) XOXOOXO, 3) XOXOOOX,
    4) XOOXOXO, 5) XOOXOOX,
    6) XOOOXOX, 7) OXOXOXO,
    8) OXOXOOX, 9) OXOOXOX, and
    10) OOXOXOX.

    A) 4 B) 6 C) 8 D) 10

    28. D

29. Mo and Jo with Bo and Ko have a total of 273 coins. If we subtract the 127 coins Mo and Bo have, Jo and Ko have 146.
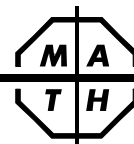
    A) 106 B) 128 C) 135 D) 146

    29. D

30. Place 100 2 x 2 squares in a line. The perimeter is $2 \times (2 + 200) = 404$.

    A) 88 B) 100 C) 400 D) 404

    30. D

The end of the contest ☞ **5**

Visit our Web site at http://www.mathleague.com
Steven R. Conrad, Daniel Flegler, and *Adam Raichel,* contest authors

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Information & Solutions

Spring, 2013

5

Directions for Grading

- **Date** You may give this contest any time after April 15. The *5th 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 or 1-516-365-5656.

- **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. Since 14 days before Saturday is Saturday, 4 more days before that would be Tuesday.

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

   1. A

2. $(1 + 2 + 3) \times 10 = 60 = 30 + 20 + 10.$

   A) 10   B) 11   C) 33   D) 44

   2. A

3. I listened to 6 songs before the one I'm listening to now, and I will listen to 6 more after this one. That's $6 + 1 + 6 = 13$ songs.

   A) 11   B) 12   C) 13   D) 14

   3. C

4. 100 hundreds $\div$ 10 tens $= 10\,000 \div 100 = 100.$

   A) 10   B) 100   C) 1000   D) 10 000

   4. B

5. $9 + 99 + 999 = 9 \times (1 + 11 + 111) = 9 \times 123.$

   A) 111   B) 112   C) 122   D) 123

   5. D

6. I created 30 characters, 3 for each video game I own. That means I own $30 \div 3 = 10$ video games.

   A) 10   B) 33   C) 40   D) 90

   6. A

7. If I add the number of sides that a hexagon has (6) to the number of sides that a pentagon has (5), then the sum is $6 + 5 = 11$, which is odd.

   A) rhombus   B) square   C) pentagon   D) quadrilateral

   7. C

8. $40 + 30 \times 20 + 10 \times 0 = 40 + 600 + 0 = 640.$

   A) 0   B) 150   C) 640   D) 1400

   8. C

9. Subtract 6 from 30 to get 24, which is twice my age. Therefore, I am 12 years old. My brother is 6 years older than I am, so he is 18.

   A) 12   B) 15   C) 18   D) 21

   9. C

10. Since $\$50 - \$16 = \$34$, Don paid $\$34 \div 5 = \$6.80$ per tropical punch.

    A) $5.20   B) $6.80
    C) $8.20   D) $8.80

    10. B

11. The average of 12 and 24 is $(12 + 24) \div 2 = 18.$

    A) 13   B) 18   C) 24   D) 36

    11. B

12. One hr. and 46 min. $= (60 + 46)$ min. $= 106$ minutes. Playing at twice that speed, it would take Manuel $106 \div 2 = 53$ minutes to play the concerto.

    A) 53   B) 73   C) 83   D) 212

    12. A

13. Add 60 to 180 and divide by 3: $240 \div 3 = 80.$

    A) 40   B) 60   C) 70   D) 80

    13. D

14. There are a total of 2013 students enrolled at 8 high schools. There are 234 students at each of 4 of the schools, for a total of 936 students. That leaves $2013 - 936 = 1077$ students.

    A) 1077   B) 1123   C) 1234   D) 1443

    14. A

15. Three different books, *A*, *B*, *C*, are arranged on my bookshelf. They may be arranged as *ABC*, *ACB*, *BAC*, *BCA*, *CAB*, or *CBA*.

    A) 3   B) 4   C) 5   D) 6

    15. D

16. A square piece of paper has a perimeter of 36 cm. Twice the perimeter is 72 cm. Each side is $72 \div 4 = 18$ cm, and the area is 324 cm^2.

    A) 72 cm^2 B) 108 cm^2 C) 144 cm^2 D) 324 cm^2

    16. D

17. The value of 1 quarter, 1 dime, and 1 nickel is 40¢. My coins must have a total value divisible by 40, but $3.80 is not divisible by 40.

    A) $2.40   B) $3.80   C) $4.40   D) $5.20

    17. B

18. The whole number factors of 12 are 1, 2, 3, 4, 6, and 12.

    A) 6   B) 9   C) 12   D) 16

    18. C

19. The least common multiple of 10 and 24 is 120; the greatest common factor of 10 and 24 is 2. Their sum is $120 + 2 = 122.$

    A) 121   B) 122   C) 241   D) 242

    19. B

20. For every 8 vehicles in the lot, 5 are cars and 3 are trucks. If the lot has 120 vehicles, that's 15 groups of 8. Each group has 5 cars: $15 \times 5 = 75.$

    A) 24   B) 45   C) 75   D) 80

    20. C

21. A rate of 600 m/min. $= 60\,000$ cm/min. $= 60\,000$ cm/ 60 sec. $= 1000$ cm/sec.

    A) 100   B) 600
    C) 1000   D) 60 000

    21. C