| | Answers |
|---|---|
| 30. Any 2 such diameters share the center, so they can't be parallel.<br>A) be perpendicular B) be parallel<br>C) be equal in length D) have a point in common | 30. B |
| 31. $999^2 = \sqrt{999\times999\times999\times999} = \sqrt{999}\times\sqrt{999^3}$.<br>A) 999 B) $999^2$ C) $999^3$ D) $999^4$ | 31. C |
| 32. The largest 3-digit prime number is 997. Since the only prime digit in 997 is 7, the answer is D.<br>A) 1 B) 3 C) 5 D) 7 | 32. D |
| 33. All powers of $5 \geq 5^2$ end in "25."<br>A) 0 B) 2 C) 4 D) 5 | 33. B |
| 34. The perfect-square multiples of 36 that are between $1\times36$ and $36\times36$ are $4\times36$, $9\times36$, $16\times36$, and $25\times36$.<br>A) 0 B) 4 C) 9 D) 16 | 34. B |
| 35. $\frac{5}{3}\div\frac{3}{5} = \frac{5}{3}\times\frac{5}{3} = \frac{25}{9}$, and $\frac{25}{9}\div\frac{3}{5} = \frac{25}{9}\times\frac{5}{3} = \frac{125}{27}$.<br>A) $\frac{2}{5}$ B) $\frac{5}{3}$ C) $\frac{50}{18}$ D) $\frac{125}{27}$ | 35. D |
| 36. $(1\times100)\times(2\times50)\times(4\times25)\times(5\times20)\times10\div100 = 10^9\div10^2 = 10^7$.<br>A) 1 B) 100 C) $100^4$ D) $10^7$ | 36. D |
| 37. If $a\triangle b\triangle c = a\times c + b\times c$, then $7\triangle8\triangle9 = 7\times9 + 8\times9 = 135$.<br>A) 128 B) 135 C) 272 D) 639 | 37. B |
| 38. $1+\frac{2}{3+\frac{4}{5}} = 1+\frac{2}{\frac{19}{5}} = 1+(2\div\frac{19}{5}) = 1+2\times\frac{5}{19} = 1+\frac{10}{19} = 1\frac{10}{19}$.<br>A) $1\frac{10}{19}$ B) $1\frac{10}{12}$ C) $2\frac{3}{7}$ D) $8\frac{2}{5}$ | 38. A |
| 39. Speedy Rabbit's average speed was (800 m)÷5 min. = 160 m/min. To finish in 4 minutes, he would have to increase his average speed to 200 m/min., a 25% increase.<br>A) 20% B) 25% C) 30% D) 40% | 39. B |
| 40. Each time 2 rabbits drop out, one comes back in. This happens 13 times. Each time, the net loss is 1 rabbit. The number of rabbits left in the end is 50−13 = 37.<br>A) 20 B) 24 C) 37 D) 39 | 40. C |

*The end of the contest* 7



MATH

SEVENTH GRADE MATHEMATICS CONTEST

Math League Press, P.O. Box 17, Tenafly, New Jersey 07670-0017

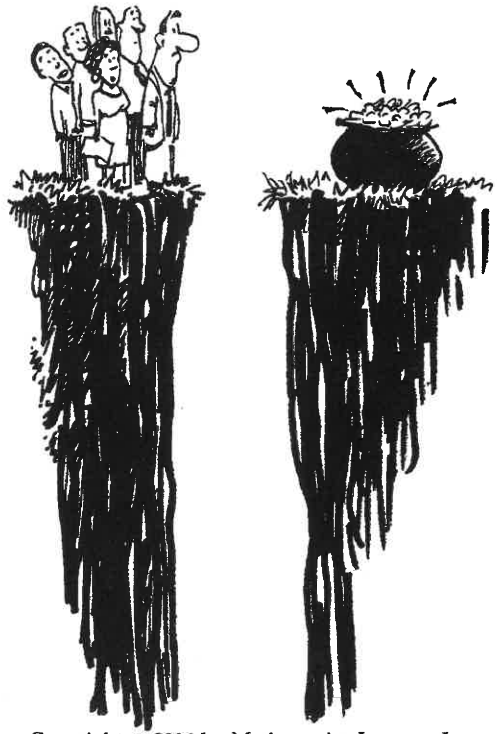
# Information & Solutions

*February 21 or 28, 2006*

7

## Contest Information

- **Solutions** Turn the page for detailed contest solutions (written in the question boxes) and letter answers (written in the *Answers* column to the right of each question).
- **Scores** Please remember that *this is a contest, not a test*—and there is no "passing" or "failing" score. Few students score as high as 30 points (75% correct). Students with half that, 15 points, *deserve commendation!*
- **Answers & Rating Scale** Turn to page 142 for the letter answers to each question and the rating scale for this contest.



| | Answers |
|---|---|
| 1. $24\,242 + 42\,424 = 66\,666 = 22\,222 \times 3$.<br>A) 2 B) 3 C) 4 D) 6 | 1. B |
| 2. In a regular year, March 1 to February 1 is $365-28 = 337$ days. In a leap year, March 1 to February 1 is $366-29 = 337$ days. Either way, the pot of gold weighs 337 kg.<br>A) 335 B) 336 C) 337 D) 338 | 2. C |
| 3. Try examples: $3-1 = 2$; $5-3 = 2$.<br>A) 0 B) 1 C) 2 D) 3 | 3. C |
| 4. $(18+19+20+21+22)\div 5 = 100\div 5 = 20$.<br>A) 19 B) 20 C) 20.5 D) 21 | 4. B |
| 5. $(64\div 8)\times 4\times 2 = 8\times 4\times 2 = 64$.<br>A) 1 B) 4 C) 16 D) 64 | 5. D |
| 6. $10\times 500$ cm $= 10\times 5$ m $= 5\times 10$ m.<br>A) 5000 B) 1000 C) 100 D) 10 | 6. D |
| 7. Twice my age = 120 months = 10 years. My age, in years, is 5.<br>A) 5 B) 10 C) 12 D) 60 | 7. A |
| 8. Perimeter $\div 4$ = side-length, which must be even; but $12\div 4 = 3$.<br>A) 12 B) 16 C) 24 D) 32 | 8. A |
| 9. $(100+99+98)-(99+98+97) = 100+(99-99)+(98-98)-97 = 3$.<br>A) 1 B) 3 C) 4 D) 97 | 9. B |
| 10. We need $(64\times 2) = 128$ slices, so we need $128\div 8 = 16$ pizzas.<br>A) 32 B) 16 C) 8 D) 4 | 10. B |
| 11. $3^2-2^2-1^2 = 9-4-1 = 5-1 = 4$.<br>A) 0 B) 1 C) 3 D) 4 | 11. D |
| 12. If 1 Red River beaver eats as much as 6 White River beavers, and 6 White River beavers eat as much as 8 Green River beavers, then 5 Red River beavers eat as much as $5\times 8$ Green River beavers.<br>A) 20 B) 30 C) 40 D) 60 | 12. C |
| 13. $1\times 10^2 = 100$, $8\times 10^1 = 80$, $10\times 8^1 = 80$, and $18\times 1^{10} = 18$.<br>A) $1\times 10^2$ B) $8\times 10^1$ C) $10\times 8^1$ D) $18\times 1^{10}$ | 13. A |
| 14. 1 tenth − 1 hundredth = 0.10 − 0.01 = 0.09.<br>A) 9.90 B) 0.99 C) 0.90 D) 0.09 | 14. D |
| 15. 2 halves = 3 thirds. Tripling both sides, 6 halves = 9 thirds.<br>A) 3 B) 4 C) 9 D) 12 | 15. C |





| | Answers |
|---|---|
| 16. $(20\times 16\times 12\times 8)\div(5\times 4\times 3\times 2) = 4\times 4\times 4\times 4$; the remainder is 0.<br>A) 0 B) 1 C) 2 D) 4 | 16. A |
| 17. Since $6^4 = (3\times 2)^4$, $3\times 3\times 3\times 3 = 9^2$ is the largest odd factor of $6^4$.<br>A) 3 B) $3^3$ C) $9^2$ D) $9^4$ | 17. C |
| 18. The greatest distance is the length of a diameter $= 2\times 2 = 4$.<br>A) 1 B) 2 C) 4 D) $4\pi$ | 18. D |
| 19. The quotient $\frac{1}{2}\div\frac{3}{4} = \frac{1}{2}\times\frac{4}{3} = \frac{2}{3} = 2\div 3$.<br>A) $\frac{3}{4}$ B) $\frac{4}{3}$ C) 3 D) 4 | 19. C |
| 20. (# nickels) in \$40 = $2\times$(# dimes) in \$40 = $4\times$(# dimes) in \$20.<br>A) \$10 B) \$20 C) \$80 D) \$160 | 20. B |
| 21. Since $\frac{1}{2}+\frac{1}{3} = \frac{5}{6}$, its reciprocal is $\frac{6}{5}$, and $\frac{1}{5}\times\frac{6}{5} = \frac{6}{25}$.<br>A) $\frac{6}{25}$ B) $\frac{6}{5}$ C) $\frac{1}{6}$ D) 1 | 21. A |
| 22. Since $\frac{1}{3}\times\frac{1}{3} = \frac{1}{9}$ of my pockets are empty pockets that have a hole, then $\frac{8}{9}$ are *not* empty pockets that have a hole.<br>A) $\frac{1}{3}$ B) $\frac{5}{9}$ C) $\frac{2}{3}$ D) $\frac{8}{9}$ | 22. D |
| 23. 1% of 1 = 0.01 = 10% of 0.10.<br>A) 10 B) 1 C) 0.10 D) 0.01 | 23. C |
| 24. The average of 0, 1, 2, . . . 12, 13, and 14 is 7. Their product is 0.<br>A) 0 B) 7 C) 105 D) 5040 | 24. A |
| 25. $\sqrt{36+64} = \sqrt{100} = 10 = 2\times 5 = \sqrt{4}\times\sqrt{25}$.<br>A) 16 B) 25 C) 36 D) 49 | 25. B |
| 26. Since the sum of the lengths of the 2 smaller sides must *exceed* the length of the longest side, the longest side is at most 11.<br>A) 11 B) 13 C) 16 D) 22 | 26. A |
| 27. $21+42+63+84+105+126 = 21\times(1+2+3+4+5+6) = 21\times 21$.<br>A) 6 B) 7 C) 21 D) 42 | 27. C |
| 28. In 7 days, this truck carries $7\times 20 =$ 140 loads. This is $140/350 =$ 2/5 or 40% of a 350-load job.<br>A) 42% B) 40% C) 30% D) 6% | 28. B |
| 29. $\frac{1+2+3}{2+4+6}+\frac{4+8+12}{1+2+3} = \frac{1}{2}+4 = \frac{9}{2}$.<br>A) 2 B) $\frac{8}{3}$ C) 4 D) $\frac{9}{2}$ | 29. D |