30. Since $18 = 2\times(1 + 8)$, the two-digit number is 18. The sum of the digits of 18 is 9.
A) 9 B) 12 C) 18 D) 36 — **30. A**

31. From the top of a step to the top of the step above is 25 cm + 2 cm = 27 cm. From the top of step 1 to the top of step 6 is 5×27 cm = 135 cm. It's another 25 cm from the top of step 6 to the bottom of step 7. The distance from step 1 to step 7 is 135 cm + 25 cm = 160 cm.
A) 135 cm B) 137 cm C) 160 cm D) 162 cm — **31. C**

32. The 3 integers must add up to 9. If we use 1, 2, and 6, their product is $1\times2\times6 = 12$.
A) 9 B) 12 C) 24 D) 27 — **32. B**

33. *2543* = $2\times3 + 5\times4 = 6 + 20 = 26$.
A) 14 B) 22 C) 26 D) 120 — **33. C**

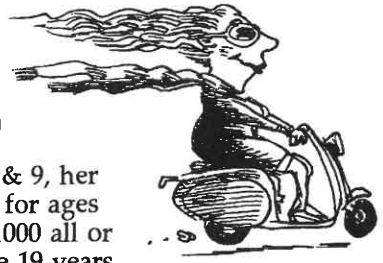
34. Using 3 & 1, sum = 3+1 = **4**, difference = 3 - 1 = **2**, and quotient = **4**÷**2** = 2, so it's D.
A) 0 B) 0.5 C) 1 D) 2 — **34. D**

35. (# mins in 1 sec) ÷ (# secs in 1 min) = $\frac{1}{60} \div 60 = 1/3600 < 1$.
A) 3600 B) 60 C) 1 D) less than 1 — **35. D**

36. $(\frac{1}{111} \div 111)\times100\% = \frac{1}{111^2}\times100\% = 0.008\%$ (to the nearest 0.001%).
A) 0.008% B) 0.009% C) 0.901% D) 1.000% — **36. A**

37. $\sqrt{\sqrt{9^{16}}} = \sqrt{9^8} = 9^4$. A) 3^2 B) 9^2 C) 9^4 D) 9^8 — **37. C**

38. The easiest approach is to try an example: 10 km in 10 mins. is 1 km/min., but 12 km in 8 mins. is 1.5 km/min.
A) 140 B) 150 C) 160 D) 170 — **38. B**



39. For parts of the year for ages 8 & 9, her age in months > 100. Similarly, for ages 83 to 99, her age in months > 1000 all or part of the time. In all, there are 19 years.
A) 16 B) 17 C) 18 D) 19 — **39. D**

40. Each of the larger integers is 2004 more than the corresponding smaller one. The total difference between them is 2004×2004.
A) 2004 B) 4008 C) 2004^2 D) 4008^2 — **40. C**

The end of the contest 8

M A T H

EIGHTH GRADE MATHEMATICS CONTEST

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

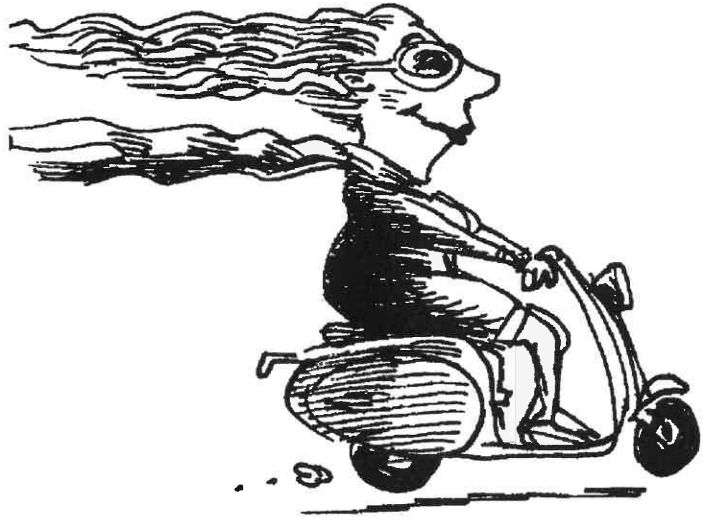
Information & Solutions

Tuesday, February 17 or 24, 2004

8

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 145 for the letter answers to each question and the rating scale for this contest.



	Answers
1. $(99-98)\times(88-87)\times(77-76)\times(66-65) = 1\times1\times1\times1 = 1.$ A) 0 B) 1 C) 4 D) 11	1. B
2. $1^2+(-1)^2-1^2 = 1+1-1 = 1.$ A) 1 B) -1 C) 0 D) 3	2. A
3. Multiply each choice by 4 to find the perimeter. Since $4\times0.75 = 3$, the correct answer is choice B. A) 0.50 B) 0.75 C) 1.00 D) 1.50	3. B
4. $7\times(3+4+5+6+7+8+9) = 7\times42.$ A) 7 B) 14 C) 42 D) 49	4. C
5. $\frac{3}{12} = \frac{1}{4} = \frac{4}{16}.$ A) 4 B) 3 C) $\frac{1}{4}$ D) 25%	5. A
6. The largest angle in an obtuse triangle is greater than 90°. A) equilateral B) acute C) obtuse D) right	6. C
7. $30\times25¢ + 30\times10¢ + 30\times5¢ + 30\times1¢ = \$12.30$; $30\times50¢ = \$15$. Paying with 30 half-dollars overpays by \$15 - \$12.30 = \$2.70. A) \$2.30 B) \$2.70 C) \$3.00 D) \$3.20	7. B
8. Since $3999¢\div39¢ \approx 102.5$, I can buy *at most* 102 trinkets. A) 100 B) 101 C) 102 D) 103	8. C
9. $8765\times4321 = 37\,873\,565$, a number whose tens' digit is 6. A) 5 B) 6 C) 7 D) 8	9. B
10. 1 grain weighs 0.01 g, so 100 grains weigh 1 g. Since 1 kg = 1000 g, 1 kg contains $1000\times100 = 100\,000$ grains. A) 100 B) 1000 C) 10 000 D) 100 000	10. D
11. $120\div2 = 180\div3 = 240\div4 = 60 = 360\div6.$ A) 5 B) 6 C) 8 D) 12	11. B
12. The additive inverse of $\frac{1}{2}$ is $-\frac{1}{2}$. A) negative B) whole C) prime D) positive	12. A
13. If May 1 is a Saturday, then May 2, May 9, May 16, May 23, and May 30 are all Sundays. Kay will have 5 sundaes in May. A) 2 B) 3 C) 4 D) 5	13. D
14. The sum of two odd numbers can never be odd. A) 124 B) 142 C) 214 D) 241	14. D
15. If twice a number is 96, then the number is 48; 48/3 = 16. A) 16 B) 32 C) 48 D) 64	15. A

Go on to the next page 8

	Answers
16. The gcfs of the choices are 3, 9, 6, and 3, respectively. A) 33, 90 B) 36, 63 C) 66, 96 D) 99, 39	16. B
17. Try an example: 20 + 20 + 20 + 20 + 20 = 100, and 22 + 22 + 22 + 22 + 22 = 110. A) 1 B) 2 C) 10 D) 50	17. C
18. I need $32\times3 = 96$ minutes to draw, but I rest 31 times between sketches, and $31\times2 = 62$ mins. Total time = 158 mins. = 2 hr 38 mins. A) 4:37 B) 4:38 C) 4:39 D) 4:40	18. B
19. 3 mins. = (90 mins. ÷ 30) is (100% ÷ 30) = (10/3)%. A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{10}{3}$ D) 5	19. C
20. $(100+88)\times(100-88) = 188\times12$, and this equals 100^2-88^2. A) 0 B) 100^2 C) 2×8800 D) 100^2-88^2	20. D
21. Adding 30 triples my age, so 30 is double my age. My age is 15. A) 15 B) 12 C) 10 D) 9	21. A
22. Since $\frac{38}{57} = \frac{2}{3}$, tripling both sides gives us $3\times\frac{38}{57} = 3\times\frac{2}{3} = 2.$ A) 2 B) 19 C) 38 D) 57	22. A
23. Since $1^{25} = 1$, 25% = 0.25, and 1/25 = 0.04, choice D is greatest. A) 1^{25} B) 25% C) $\frac{1}{25}$ D) 2.5	23. D
24. *AC* must be less than 18, so the perimeter is less than 18+18. A) 33 B) 34 C) 35 D) 36	24. D
25. If you add 1, 2, 3, . . . , 100, and I add 2, 3, 4, . . . , 100, then the least possible difference between your sum and mine is 1. A) 0 B) 1 C) 99 D) 100	25. B
26. Since 1 km = 1000 m, a ball with a 5 m circumference needs $1000\div5$ turns. A) 400 B) 314 C) 200 D) 100	26. C
27. The square root of 4^4 is 4^2, and the square root of 4^2 is 4. A) 4^2 B) 4^3 C) 4^4 D) 4^8	27. C
28. The reciprocal of $\frac{2}{3}\times\frac{5}{6} = \frac{10}{18}$ is $\frac{18}{10} = \frac{3}{2}\times\frac{6}{5}$. A) $\frac{2}{3}\times\frac{5}{6}$ B) $\frac{2}{3}\times\frac{6}{5}$ C) $\frac{3}{2}\times\frac{5}{6}$ D) $\frac{3}{2}\times\frac{6}{5}$	28. D
29. The smallest such sum is 6 + 12 + 18 + 24 + 30 = 90. A) 60 B) 90 C) 130 D) 160	29. B

Go on to the next page 8