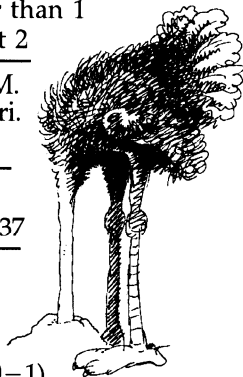
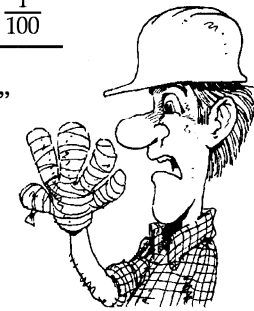


1. $111\ 111 + 333\ 333 + 222\ 222 + 444\ 444 = 111\ 111 \times (1+2+3+4) = 222\ 222 \times 5$. A) 1 B) 4 C) 5 D) 10	1. C
2. $257 \div 5 = 51.4$, and $.4 = 4/10 = 2/5$, signifying a remainder of 2. A) $257 \div 5$ B) $228 \div 6$ C) $195 \div 3$ D) $176 \div 4$	2. A
3. Use commutativity: 6 twos = 2 sixes, and 8 threes = 3 eights A) 3 B) 6 C) 8 D) 12	3. A
4. $2 + (10 \times 2) + (100 \times 2) + (1000 \times 2) = 2 + 20 + 200 + 2000 = 2222$. A) 224 B) 2000 C) 2220 D) 2222	4. D
5. Only choice A is a whole number, with $182 \div 7 = 26$. A) $\frac{182}{7}$ B) $\frac{172}{12}$ C) $\frac{189}{17}$ D) $\frac{178}{21}$	5. A
6. Four 2^2 's = $2^2 \times 4 = 2^2 \times 2^2$. A) 2^1 B) 2^2 C) 2^3 D) 2^4	6. B
7. The tens' digit is second to the left of the decimal point. The tens' digit of choice A is a 3, the largest tens' digit below. A) \$1231.21 B) \$1123.03 C) \$3010.30 D) \$2302.12	7. A
8. February 1st, 8th, 15th, 22nd, and 29th can all fall on a Tuesday. A) 3 B) 4 C) 5 D) 6	8. C
9. $\frac{1+2}{3} + \frac{4+5}{6} = \frac{3}{3} + \frac{9}{6} = \frac{6}{6} + \frac{9}{6} = \frac{15}{6} = \frac{7+8}{9-3}$. A) 0 B) 3 C) 6 D) 12	9. B
10. A square with side 9 has area 81. A rectangle with width 3 and area 81 has length $81 \div 3 = 27$. Its perimeter is $3+27+3+27 = 60$. A) 27 B) 36 C) 60 D) 81	10. C
11. The product of 2 positive numbers is always positive. A) greater than 0 B) greater than 1 C) greater than 2 D) at least 2	11. A
12. $98 \div 24 = 4 \frac{2}{24} = 4$ days + 2 hr. after 11 P.M. Sun. = 2 hr. after 11 P.M. Thurs. = 1 A.M. Fri. A) Tues. B) Wed. C) Thurs. D) Fri.	12. D
13. $4+9+25 = 38 = 2 \times 19$, and 19 is a prime. A) 5 B) 13 C) 19 D) 37	13. C
14. The smallest prime is 2. Its reciprocal is $\frac{1}{2}$. A) 0 B) $\frac{1}{2}$ C) 1 D) 2	14. B
15. $(20 \times 100) - (20 \times 10) - (20 \times 1) = 20 \times (100 - 10 - 1)$. A) 20×111 B) 20×109 C) 20×91 D) 20×89	15. D




16. Days: $4.5 \div 24 = 3/16$; mins.: $4.5 \times 60 = 270$; secs.: $270 \times 60 = 16200$. A) $\frac{3}{16}$ day B) 270 min C) 16 200 sec D) $\frac{3}{100}$ week	16. D
17. Since 1 m = 100 cm, 15 cm is $15/100 = 3/20$ of 1 m. A) $\frac{1}{10}$ B) $\frac{3}{20}$ C) $\frac{1}{15}$ D) $\frac{10}{15}$	17. B
18. One thousandth = 0.001. Multiply by 100 to get = $0.100 = 0.1$. A) 100 B) 1000 C) 10 000 D) $\frac{1}{100}$	18. A
19. Since $40\% + 38\% = 78\%$ answered "yes" or "no," $100\% - 78\% = 22\%$ said "Ouch." Finally, 22% of $250 = 0.22 \times 250 = 55$. A) 22 B) 25 C) 55 D) 195	19. C
20. Subtract first, so $\sqrt{25 - 16} = \sqrt{9} = 3$. A) 9 B) 3 C) 1 D) -11	20. B
21. Jill is 3 years older than Jack, so Jack is 20 and Jill is 23. In 2 years, Jill will be 25. A) 20 B) 22 C) 23 D) 25	21. D
22. My average on 5 tests was 95. Their sum was $5 \times 95 = 475$. A) 95 B) 100 C) 475 D) 495	22. C
23. Add first: $1 + \frac{7}{8} = \frac{15}{8}$. The reciprocal of this is $\frac{8}{15}$. A) $\frac{8}{15}$ B) $1 + \frac{8}{7}$ C) $\frac{15}{8}$ D) $\frac{7}{15}$	23. A
24. If I have 1 dime and 2 quarters, I have 10¢ in dimes and 50¢ in quarters. Notice that I have one-half as many dimes as quarters. A) one-half B) one-fifth C) two-thirds D) twice	24. A
25. The year 2000 is a leap year, so the average is $366 \div 12 = 30.5$. A) 29 B) 30 C) 30.5 D) 31	25. C
26. 162 is divisible by 1, 2, 3, 6, and 9, but <i>not</i> by 0, 4, 5, 7, or 8. A) 6 B) 5 C) 4 D) 3	26. B
27. Filling both blanks with the same choice, try to satisfy " <u>?</u> months + 55 = <u>?</u> years." With choice C, we get: 60 mos. + 55 yrs = 60 yrs. A) 48 B) 55 C) 60 D) 66	27. C
28. $30 = 10\%$ of $300 = 1\%$ of $3000 = 0.1\%$ of $30\ 000$. A) 3 B) 300 C) 3000 D) 30 000	28. D
29. midway # = $(1234\ 567 + 7654\ 321) \div 2 = 8888\ 888 \div 2 = 4444\ 444$. A) 3765432 B) 4321321 C) 4444444 D) 3456789	29. C



30. If $P = 3$ cm, then $s = 3/4$ cm, and area = $(3/4)^2 = 9/16$ cm ² . A) $\frac{9}{16}$ cm ² B) $\frac{3}{2}$ cm ² C) 3 cm ² D) 9 cm ²	30. A
31. Squares of consecutive integers differ by the sum of the integers. A) 0 B) 34592867542 C) 34592867543 D) 34592867544	31. D
32. 10 oranges cost as much as 4 grapefruits, and 4 grapefruits cost as much as 12 apples, so 10 oranges cost as much as 12 apples. A) 6 B) 9 C) 10 D) 12	32. D
33. If the area of the "other" circle is $\pi(r)^2$, then the area of the <i>Winner's Circle</i> is $4\pi r^2 = \pi(2r)^2$; so its radius is twice the "other" circle's radius. A) exactly B) twice C) one-fourth D) 4 times	33. B
34. $A \approx 0.7071$; $B = 0.5$; $C = D = 0.25$. A) $\sqrt{\frac{1}{2}}$ B) $\sqrt{\frac{1}{4}}$ C) $\frac{1}{4}$ D) $(\frac{1}{2})^2$	34. A
35. The second hand makes 1 revolution per minute = 60×24 per day. A) 60 B) 1440 C) 3600 D) 86 400	35. B
36. The digits of 85 030 add up to 16, so 3 is not a factor of 85 030. A) 543 420 B) 85 030 C) 72 630 D) 53 430	36. B
37. 30 days: 4 mos.; 31 days: 7 mos.; 29 days: 1 mo.; so there are 187 odd days and 179 even. I save $\$187 + \$2 \times 179 = \$545$. A) \$16 B) \$538 C) \$545 D) \$549	37. C
38. $\sqrt{999\,999\,999} \approx 31622.7$, so largest square is $31622^2 = 999\,950\,884$. A) 0 B) 1 C) 4 D) 9	38. C
39. The five 1 km legs of the race took $(1 \div 5 + 1 \div 4 + 1 \div 3 + 1 \div 2 + 1 \div 1)$ hours = $(12 + 15 + 20 + 30 + 60)$ minutes = 137 minutes. A) 120 B) 137 C) 216 D) 685	39. B
40. Each piece has straight cuts as edges, so each is a polygon and each has <i>at least</i> 3 edges. Altogether, the three polygons have a total of <i>at least</i> $3 \times 3 = 9$ edges. See the illustrations below. A) 8 B) 9 C) 10 D) 11	40. A



The end of the contest  **7**



Information & Solutions

February, 2000

Contest Information

7

- **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** Math League's contest problem books come complete with difficulty ratings for each contest.
- **About Math League Contests** Each year the Math League sponsors math contests for grades 4, 5, 6, 7, 8, Algebra Course 1, and High School. Twelve books of past contests, *Grades 4, 5, & 6 (Volumes 1, 2, 3, & 4)*, *Grades 7 & 8 (Volumes 1, 2, 3, & 4)* and *High School, (Volumes 1, 2, 3, & 4)* are available, for \$12.95 each volume (\$19.95 Canadian), from Math League Press, P.O. Box 17, Tenafly, N.J. 07670-0017. Visit us on the web at <http://www.MathLeague.com/> or call (201) 568-6328 for more information on our books, software, and math contests.

