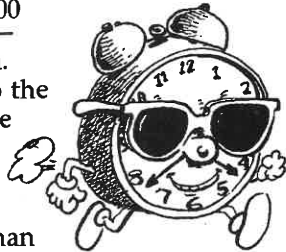
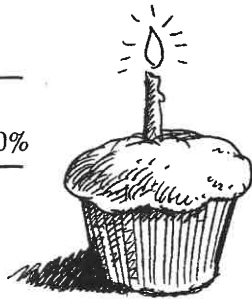
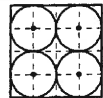


29. The 1st 12 won $12 \times \$80 = \960 . The next 20 won $20 \times \$70 = \1400 . The 32 contestants won an average of $\$2360 \div 32 = \73.75 . A) \$73.75 B) \$74.75 C) \$75.00 D) \$75.75	29. A
30. $4^3 \times 4^3 = 4^{3+3} = 4^6$. A) 16^9 B) 16^6 C) 4^9 D) 4^6	30. D
31. 4 such circles fit inside a square of side-length 4. A) 1 B) 4 C) 5 D) 16	31. B
32. Just as $1 - 0.9 = 0.1$, $0.1\% = 1.0\% - 0.9\%$. A) 0.009% B) 0.09% C) 0.9% D) 10%	32. C
33. Change each answer choice to months. Since 6 years = 72 months, and 5 years ago I was 1 year old, choice A is correct. A) 6 B) 7 C) 8 D) 12	33. A
34. $\sqrt{81 \times 81 \times 81 \times 81} = \sqrt{81^4} = 81^2$, so $\sqrt{\sqrt{81 \times 81 \times 81 \times 81}} = \sqrt{81^2} = 81$. A) 3 B) 9 C) 27 D) 81	34. D
35. If a product is even, at least 1 factor must be even. A) 2005 B) 2004 C) 1 D) 0	35. B
36. $1/2$ is one-fourth of 2, its reciprocal, so choice A is correct. A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) 2 D) 4	36. A
37. $21 = 3 \times 7$; $51 = 3 \times 17$; $81 = 3 \times 27$; $91 = 7 \times 13$. Other 5 are prime. A) 4 B) 5 C) 6 D) 7	37. B
38. $(301-1) + (302-2) + \dots + (325-25) = (300) \times 25 = 7500$. A) 25 B) 2500 C) 5000 D) 7500	38. D
39. Angle at 4:30 is 45° . Each min., the min. hand moves 6° , hr. hand moves 0.5° , so the angle increases 5.5° . The 8-min. increase is 44° , so the angle at 4:38 is only 89° . A) 4:36 B) 4:37 C) 4:38 D) 4:39	39. D
40. If $H+K+L+N = 2005$, then H is less than $2005 \div 4 = 501.25$. If $H = 498$, $H+K+L+N = 498+501+502+504 = 2005$. Since M and N are the middle of the alphabet, the average of all 26 letters is $(503+504) \div 2 = 503.5$. A) 491 B) 498 C) 503.5 D) 505.5	40. C



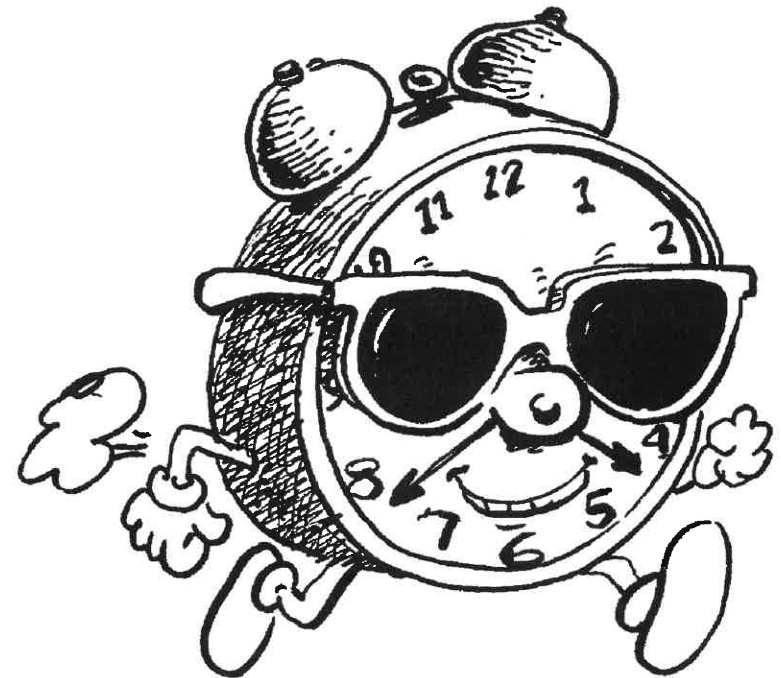
Information & Solutions

February 15 or 22, 2005

Contest Information

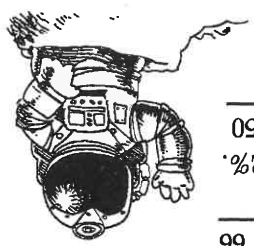
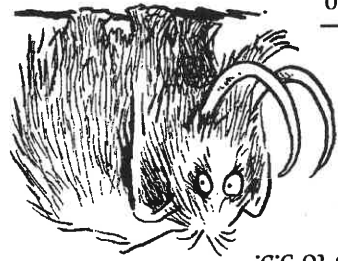
7

- 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** Turn to page 141 for the letter answers to each question and the rating scale for this contest.



The end of the contest 7

1.	A) 5 B) 6 C) 7 D) 14	84 players can split into $84 \div 6 = 14$ teams of 6 players and $84 \div 4 = 21$ teams of 4 players. There are 7 more teams of 4.
2.	A) 0 B) 1 C) 3 D) 11	$2. (0 \times 1) + (1 \times 10) + (0 \times 0) + 1 = 0 + 10 + 0 + 1 = 11.$
3.	A) 60° B) 80° C) 90° D) 120°	The sum is 180°. The 3rd angle must be $180^\circ - (20^\circ + 40^\circ) = 120^\circ.$
4.	A) 0.3 B) 3.4 C) 3.5 D) 34.6	$3456 \times 0.001 = 3.456.$ This rounds up to 3.5.
5.	A) 1:20 A.M. B) 7:20 A.M. C) 12:00 P.M. D) 7:08 P.M.	Since 720 minutes = $(720 \div 60)$ hours = 12 hours, my bad hair day began at 7:20 A.M.
6.	A) 25 B) 50 C) 250 D) 2000	The sum = $5 \times 500 = 2500 = 10 \times 250.$
7.	A) 88 B) 89 C) 90 D) 99	Since every number on the list is greater than the sum of its digits, all 90 numbers are greater than the sum of their digits.
8.	A) $1^3 + 2^4 = 17 = 1^3 + 4^2$ B) $1^3 + 3^2$ C) $1^2 + 4^3$ D) $1^1 + 3^4$	
9.	A) 10 B) 11 C) 12 D) 13	There are 11 prime days in May: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, and 31.
10.	A) 1 B) 3 C) 6 D) 12	$(\frac{3}{2} \times \frac{2}{3}) \times (\frac{5}{4} \times \frac{4}{5}) \times (\frac{7}{6} \times \frac{6}{7}) = 1 \times 1 \times 1 = 1.$
11.	A) 100 B) 250 C) 500 D) 2500	Since 5 nickels = 1 quarter, 500 nickels = 100 quarters.
12.	A) 33 B) 44 C) 55 D) 66	All side-lengths are equal, so the perimeter is divisible by 4.
13.	A) 2 B) 3 C) 5 D) 50	3 of every 150 is the same as 1 of every 50. That's the same as 2 of every 100, which is 2%.
14.	A) $\frac{15}{9}$ B) $\frac{35}{21}$ C) $\frac{40}{24}$ D) $\frac{50}{33}$	$\frac{50}{33}$ cannot be reduced.
15.	A) 2 B) 4 C) 16 D) 64	$\sqrt{100} = \sqrt{36 + 64} = \sqrt{36} + \sqrt{64} = 6 + 8 = 14$



16.	A) An octagon B) A hexagon C) A rectangle D) A triangle	As shown, 2 squares with a common side form a rectangle.
17.	A) 9 B) 10 C) 90 D) 100	Each of the 9 numbers in the first sum is 1 more than the number in the same position in the second sum.
18.	A) 20 B) 40 C) 80 D) 98	Uncle Bookworm eats 2 books a week, or 104 a year. Aunt Bookworm eats 1 book every 2 months, or 6 a year. Uncle eats $104 - 6 = 98$ more books than Aunt.
19.	A) 3 B) 9 C) 27 D) 81	The largest odd factor of 81 is 81.
20.	A) 2 B) $\frac{9}{6}$ C) $\frac{3}{8}$ D) $\frac{27}{8}$	$(\frac{3}{2})^3 = \frac{3 \times 3 \times 3}{2 \times 2 \times 2} = \frac{27}{8}$
21.	A) 11 B) 12 C) 13 D) 24	To seat the most students, put the students in seats 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, and 25. That's 13 seated students.
22.	A) $9 \times 9 + 10$ B) $9 \times 1 \times 9.1$ C) 9×10 D) 10×10	The smallest multiple of 10 that's greater than $9 \times 9 = 81$ is 90.
23.	A) $\frac{5}{1} - \frac{6}{5} = \frac{30}{30} - \frac{36}{30} = -\frac{6}{30} = -\frac{1}{5}$ B) $\frac{1}{1} - \frac{30}{25} = \frac{6}{30} - \frac{36}{30} = -\frac{30}{30} = -1$ C) $\frac{1}{30} - \frac{30}{11} = \frac{11}{330} - \frac{30 \times 11}{330} = -\frac{289}{330}$ D) $\frac{30}{11}$	
24.	A) 3π B) 6π C) 9π D) 36π	The rear wheel's diameter is 6 cm more than the front wheel's. The rear wheel's circumference is $(d+6) \times \pi$ cm, which is 6π cm more than the front wheel's.
25.	A) square B) equilateral C) scalene D) isosceles	All sides of a regular polygon have equal lengths.
26.	A) 1 B) 2 C) 3 D) 4	My age could be 8 and yours could be 16. When you divide 16 by 5, the remainder is 1.
27.	A) 1 B) 5 C) 20 D) 26	If a rectangle's perimeter is 30 cm, and its area is 56 cm^2 , then the longer side's length is 8 cm, and the shorter side's length is 7 cm.
28.	A) 0 B) 6 C) 12 D) 48	Try some numbers. One set that works is 12 and 13. (The sum always exceeds the difference by twice the smaller number.)

