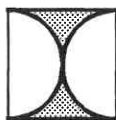
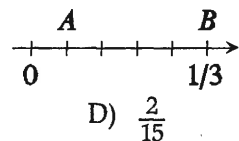


29. The product of an even and any other integer is always even. A) even B) odd C) positive D) divisible by 6	29. A
30. The circumference is $2\pi \approx 6.283$ and the perimeter is 8. Dividing, $2\pi \div 8 \approx 6.283 \div 8 \approx 0.785 \dots \approx 79\%$. A) 75% B) 76% C) 78% D) 79%	30. D
31. At 30 secs. = $\frac{1}{2}$ min. per page, I'll read the last 200 pages in 100 mins. That leaves at most $4\frac{1}{2} \times 60 - 100 = 170$ mins. for the rest. A) 50 minutes B) 170 minutes C) 180 minutes D) 200 minutes	31. B
32. The perimeter of the shaded region consists of the top and bottom sides of the square and the 2 semicircles. The perimeter is $4+2\pi$. A) $4+2\pi$ B) $8+2\pi$ C) $4+\pi$ D) $4-\pi$	32. A
33. The least prime is 2. The sum of all 20 is odd, so we must use a 2. A) 5 B) 3 C) 2 D) 1	33. C
34. The area of my 1×6 sign is 6. If I double each dimension, my new sign is a 2×12 sign whose area is 24 and whose perimeter is $2 \times (2+12) = 28$. A) 24 B) 28 C) 48 D) 56	34. B
35. $\sqrt{1\%} = \sqrt{0.01} = 0.1 = 10\%$. A) $\frac{1}{2}\%$ B) 1% C) 10% D) 100%	35. C
36. The only factors of 3^6 are $1, 3^1, 3^2, 3^3, 3^4, 3^5,$ and 3^6 . A) 3 B) 6 C) 7 D) 18	36. C
37. In 60 minutes, the second hand moves $60 \times 360^\circ = 21\,600^\circ$. A) 60° B) 360° C) 3600° D) $21\,600^\circ$	37. D
38. The factors of 3 are 1 and 3. Their average is $(1+3) \div 2 = 2$. A) 3 B) 4 C) 6 D) 8	38. A
39. Point B is at $\frac{1}{3} = \frac{5}{15}$. Point A is at $\frac{1}{15}$. The average is $(\frac{1}{15} + \frac{5}{15}) \div 2 = (\frac{6}{15}) \div 2 = \frac{3}{15} = \frac{1}{5}$. A) $\frac{1}{12}$ B) $\frac{1}{6}$ C) $\frac{1}{5}$ D) $\frac{2}{15}$	39. C
40. $1+3 = 2^2$; $1+3+5 = 3^2$; $1+3+\dots+4011 = 2006^2 = (2 \times 1003)^2$. A) 2×1003^2 B) $2^2 \times 1003^2$ C) 5×1003^2 D) 6×1003^2	40. B



APPLAUSE!



The end of the contest 8



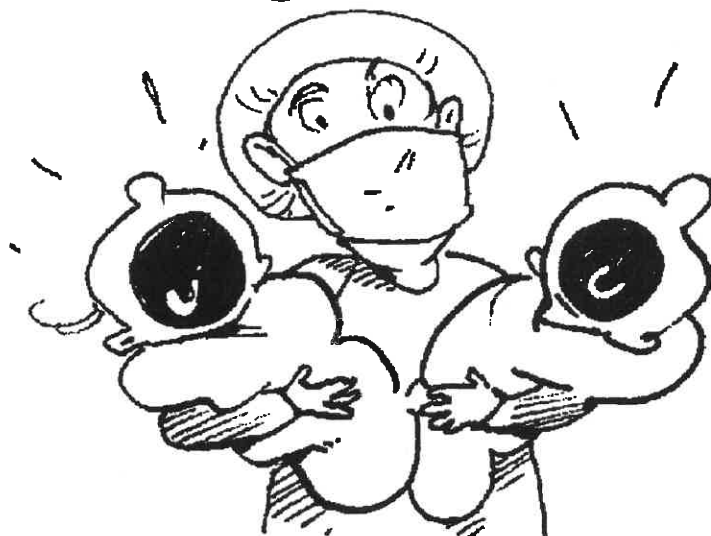
Information & Solutions


February 21 or 28, 2006


Contest Information

8

- **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 147 for the letter answers to each question and the rating scale for this contest.



1.	C	By calculator or by hand, $11011 - 1001 = 10010$. A) 1001 B) 10001 C) 10010 D) 10101
2.	A	Earth is the 5th largest of 9 planets, so 4 are larger and 4 are smaller. The ratio of the number larger to the number smaller is $4:4$, or $1:1$. A) 1:1 B) 2:1 C) 4:5 D) 5:4
3.	D	Try some: $7 \times 8 = 56$; $8 \times 9 = 72$; $9 \times 10 = 90$; $10 \times 11 = 110$. A) 65 B) 80 C) 96 D) 110
4.	B	Two perpendicular lines intersect in 1 point, as seen here: \perp . A) 0 points B) 1 point C) 2 points D) 4 points
5.	D	Since 20, 10, and 4 are not prime, the prime factorization is D. A) 2×20 B) $2 \times 2 \times 10$ C) $2 \times 4 \times 5$ D) $2 \times 2 \times 2 \times 5$
6.	C	Each of A, B, D is the sum of a positive integer and its reciprocal. A) $12 + \frac{1}{12}$ B) $6 + \frac{1}{6}$ C) $4 + \frac{1}{4}$ D) $2 + \frac{1}{2}$
7.	B	$\frac{2}{1} \times \frac{2}{1} = \frac{4}{1}$, and $\frac{4}{1} = \frac{2}{1} \div 2$. A) 4 B) 2 C) $\frac{2}{1}$ D) $\frac{4}{1}$
8.	C	A Δ may have one angle $\geq 90^\circ$; the other two must be acute. A) 0 B) 1 C) 2 D) 3
9.	A	$0.5 \times 0.5 = 0.25$, which is 0.25×1 . A) 1 B) 0.75 C) 0.25 D) 10
10.	D	There are 90 2-digit positive integers. Nine are divisible by 10: 10, 20, 30, ..., 90. So there are $90 - 9 = 81$ eggs in my basket.  A) 78 B) 79 C) 80 D) 81
11.	D	The solution to $3^2 + 3^2 = 6^2 - \frac{?}{?}$ is 18, and $18 = 3^2 + 3^2$. A) 2^2 B) 3^2 C) $2^2 + 2^2$ D) $3^2 + 3^2$
12.	D	Examples like $2 \times 6 = 12$ and $10 \times 30 = 300$ aren't divisible by 8. A) 1 B) 2 C) 4 D) 8
13.	A	One photo's area is 24. The board's is 24×40 . The quotient is 40. A) 40 B) 24 C) 20 D) 16
14.	A	$\frac{3}{2} + \frac{2}{3} + \frac{5}{2} + \frac{2}{3} + \frac{5}{2} = (\frac{3}{2} + \frac{2}{3}) + (\frac{3}{2} + \frac{2}{3}) + (\frac{5}{2} + \frac{2}{3}) = \frac{3}{6} + \frac{4}{6} + \frac{3}{6} + \frac{4}{6} + \frac{5}{6} + \frac{4}{6} = 2 + \frac{3}{6} = 2 + \frac{1}{2}$. A) $3 + 2$ B) $3 - 2$ C) $3 \div 2$ D) $2 \div 3$

15.	D	As seen below, choice D is the least. A) $(2) \div (1) - 1 = 2 - 1 = 1$ B) $1 + (1 \times 1) - 1 = 1 + 1 - 1 = 1$ C) $1 + ((1) \times 1) - 1 = 1 + (1) - 1 = 1 + 0 = 1$ D) $(1 + 1) \times (0) = 0$
16.	B	The average is $(10 - 10 + 5 - 5 + 100) \div 5 = (0 + 100) \div 5 = 20$. A) 0 B) 20 C) 25 D) 100
17.	A	The length of 1 piece is $(40 \div 4) \text{ m} = 10 \text{ m}$. The rectangle's perimeter is 10 m. The sum of the width and length is half this, 5 m. A) 5 m B) 10 m C) 20 m D) 40 m
18.	B	$0 \times 1 = 0$, $1 \times 2 = 2$, $2 \times 3 = 6$, so the ones' digit can be 0, 2, or 6. A) 1 B) 2 C) 3 D) 4
19.	A	Righty's drink is 36% soy milk. Letty's is 4% soy milk. The resulting mixture is half each, so it would be $(36\% + 4\%) \div 2 = 20\%$ soy milk.  A) 20 B) 32 C) 36 D) 40
20.	C	The least multiple of 20 that's divisible by both 8 and 12 is 120. A) 40 B) 60 C) 120 D) 1920
21.	D	Use a calculator or: $D = 770000 + 350 + 7$; each part is divisible by 7. A) 749775 B) 735814 C) 784284 D) 770357
22.	C	$\sqrt{2 \times 4 \times 6 \times 8} = \sqrt{1 \times 2 \times 3 \times 4 \times 2^4} = \sqrt{1 \times 2 \times 3 \times 4} \times 4$. A) $\sqrt{2}$ B) 2 C) 4 D) 16
23.	A	If the average of 8 numbers is 0, their sum = $8 \times (\text{avg.}) = 0$. A) equal 0 B) equal 1 C) exceed 0 D) be negative
24.	C	1 hr = 60 mins. = (60×60) secs., and (60×60) mins. = 60 hrs. A) 24 hours B) 30 hours C) 60 hours D) 90 hours
25.	A	May 16 is 46 days before July 1 and 15 days after May 1. A) May 16 B) May 17 C) June 15 D) June 16
26.	C	If all 18 diced veggies were among the 20 sliced veggies, then there could be $30 - 20 = 10$ neither sliced nor diced. A) 2 B) 8 C) 10 D) 12
27.	D	40% of 100 is 40, of 200 is 80. A) 32 B) 120 C) 180 D) 200
28.	C	$(\frac{8}{7})^7 \div (\frac{8}{7})^8 = (\frac{8}{7})^7 \times (\frac{7}{8})^8 = (\frac{8}{7})^7 \times (\frac{8}{7})^8 = (\frac{8}{7})^{7+8} = (\frac{8}{7})^{15}$. A) 1 B) $\frac{8}{7}$ C) $(\frac{8}{7})^{15}$ D) $(\frac{8}{7})^{56}$