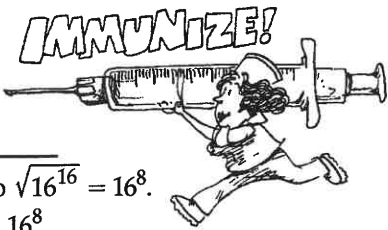
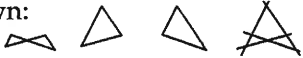




29. $2^{10} \times 2^{10} = 2^{10+10} = 2^{20}$. A) 2^{20} B) 2^{100} C) 4^{20} D) 4^{100}	29. A
30. Divide by 60 to get # minutes. Repeat to get # hours. Divide result by 24 to get # days ≈ 11.57 . A) January 11 B) January 12 C) February 1 D) February 2 	30. B
31. As in 29 above, $16^8 \times 16^8 = 16^{16}$, so $\sqrt{16^{16}} = 16^8$. A) 4^4 B) 4^8 C) 16^4 D) 16^8	31. D
32. If 2005 fractions each have an even numerator and an odd denominator of 1, their product would be an even integer. A) even B) odd C) prime D) 2005	32. A
33. In a \triangle , the sum of the 2 smaller side-lengths must be greater than the 3rd side-length. Thus, the perimeter $\leq 3+4+6 = 13$. A) 11 B) 12 C) 13 D) 14	33. C
34. $10000^{9999} = (10^4)^{9999} = 10^{39996}$. That's 1 followed by 39 996 zeroes! A) 9999 B) 10 000 C) 39 996 D) 39 997	34. D
35. The 2 small and 2 large \triangle s are shown: A) 2 B) 3 C) 4 D) 5 	35. C
36. The 2000 integers $-999, -998, \dots, 998, 999, 1000$ have a sum of 1000. The digit-sum of the largest integer used is $1+0+0+0 = 1$. A) 1 B) 2 C) 9 D) 27	36. A
37. The 9 factors divisible by 4 are 4, 8, 16, 20, 40, 80, 100, 200, & 400. A) 4 B) 8 C) 9 D) 10	37. C
38. Notice that $0^2 = 0$ and that $1^2 = 1$. These are the only two integers which are equal to their own squares. A) zero B) one C) two D) three 	38. C
39. The hr. hand moves 30° in 1 hr. and $(22/60) \times 30^\circ = 11^\circ$ in 22 mins. A) 10° B) 11° C) 21° D) 22°	39. B
40. The product includes several multiples of 10; it's divisible by 100. A) 4 B) 6 C) 8 D) 0	40. D

The end of the contest  8



Information & Solutions

February 15 or 22, 2005

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



1. Subtract 1000 from each: 110-020. A) 102 B) 101 C) 90 D) 20
2. Each side of the square has length $4 \div 4 = 1$. The square's area = $1^2 = 1$.
A) 1 B) 4 C) 8 D) 16
3. $300 \div 200 = 3/2 = 1 \times (3/2) = 1 \div (2/3)$.
A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{3}{2}$ D) $\frac{3}{3}$
4. Five-fourths = $5/4$, which is an improper fraction.
A) $\frac{5}{4}$ B) $1\frac{1}{4}$ C) 1.25 D) $\frac{4}{5}$



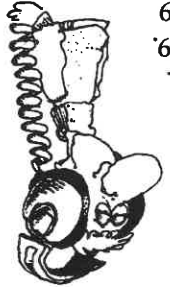
5. $(2005-2005) - 2004 = -2004$. A) 1 B) -2004 C) -2005 D) -2006
6. 120 seconds = 2 minutes, so the time is 12:02 A.M.
A) 12:02 P.M. B) 12:02 A.M. C) 2 P.M. D) 2 A.M.
7. $24 \div 4 \times 2 + 4 = [(24 \div 4) \times 2] + 4 = (6 \times 2) + 4 = 12 + 4 = 16$.
A) 1 B) 7 C) 16 D) 36



8. $\frac{2}{1} \times 4 = 2$, so its reciprocal is $\frac{1}{2} = 2 \times \frac{1}{4}$.
A) $2 \times \frac{1}{4}$ B) $\frac{2}{1} \times 4$ C) $\frac{2}{1} \times \frac{1}{4}$ D) 2×4
9. $1,000 - 0.995 = 0.005$; $1,000 - 0.990 = 0.010$;
 $1,010 - 1,000 = 0.010$; $1,100 - 1,000 = 0.100$.
A) 0.995 B) 0.99 C) 1.01 D) 1.1
10. By definition, 1 is *not* a prime, so the sum is $2+3+5+7 = 17$.
A) 15 B) 16 C) 17 D) 18

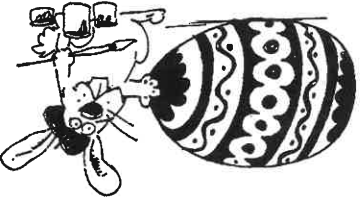
11. $2 \times \frac{2}{1} \times 4 \times \frac{4}{1} \times 6 \times \frac{6}{1} = (2 \times \frac{2}{1}) \times (4 \times \frac{4}{1}) \times (6 \times \frac{6}{1}) = 1 \times 1 \times 1 = 1$.
A) 1 B) 6 C) 12 D) 24

12. The sum of the measures of each possible pair of angles is 120° , so each angle is 60° . Therefore, triangle T *must* be equiangular.
A) scalene B) right C) obtuse D) equiangular



13. If Sunday is cloudy, then Tuesday, Thursday, and Saturday may also be cloudy. I wear my headphones at most 4 times in a week.
A) 3 B) 4 C) 5 D) 6
14. Of the choices below, D has the largest value.
A) 7 B) $(-1)^2 = 1$ C) $(-2)^2 = 4$ D) $(-3)^2 = 9$
15. $9000\% + 900\% + 90\% + 9\% = 90 + 9 + 0.9 + 0.09 = 99.99$.
A) 9999 B) 999.9 C) 99.99 D) 0.9999

16. A dealer paid Bunny Faberge 50¢ for each of his eggs. The dealer then sold each egg for 50¢ more. For each penny Faberge got, the dealer got 25¢, so Faberge got 4¢ on the dollar, which is 4%.
A) 2% B) 4% C) 25% D) 50%



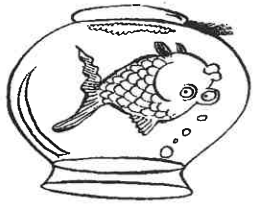
17. Since $\sqrt{256} = 16$, $\sqrt{\sqrt{256}} = \sqrt{16} = \sqrt{4} = 2$.
A) 2 B) 4 C) 8 D) 16
18. $0.3 \times 0.4 = 0.12$.
A) 12% B) 120% C) 1200% D) 12000%
19. The 4 whole numbers factors of 10 are 1, 2, 5, and 10.
A) 30 B) 24 C) 12 D) 10
20. $1/5 = 0.2 < 0.33 < 0.4 = 2/5$; 0.33 closer to 2/5.
A) 0.2 B) 0.3 C) $\frac{5}{2}$ D) $\frac{5}{3}$



21. I had 4 pennies; need 3 coins = 45¢, so I need 1 quarter; 2 coins = 20¢ are 2 dimes.
A) 0 B) 1 C) 2 D) 7
22. $1.5 \text{ m} + 60 \times 0.01 \text{ m} + 0.02 \times 1000 \text{ m} = 22.1 \text{ m}$.
A) 0.221 m B) 2.21 m C) 22.1 m D) 221 m
23. There are four even factors of 222. They are 2, 6, 74, and 222.
A) 111 B) 4 C) 3 D) 1

24. The average of 1, 2, ..., 98, 99 is the middle number, 50.
A) 49.00 B) 49.50 C) 49.75 D) 50.00

25. In the large circle, if $r = 2$, then the large circle's area would be 4π . Small circle then has $r = 1$, so $A = \pi$. That's 25% of 4π .
A) 20 B) 25 C) 40 D) 50



26. If $2/3$ cup of fish food feeds 8 goldfish, then $1/3$ cup feeds 4 fish, and 1 cup feeds 12 fish. Thus, 4 cups feed 48 fish.
A) 12 B) 24 C) 36 D) 48
27. The square of an odd number is always odd.
A) prime B) odd C) even D) zero
28. Since the reciprocal of $\frac{1}{x^3}$ is x^3 , $4x = x^3$. The value $x = 2$ works.
A) $\frac{8}{1}$ B) $\frac{1}{2}$ C) 2 D) 8