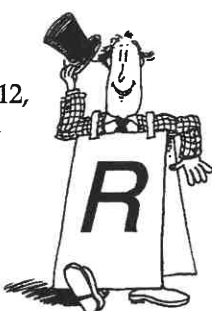


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|--|-------|
| 29. $3 \times \sqrt{25} = 15 = 5 \times \sqrt{9}$ . A) $\sqrt{3}$ B) $\sqrt{9}$ C) $\sqrt{15}$ D) $\sqrt{81}$  | 29. B |
| 30. When you divide my fraction by yours, the result is 40. When you divide your fraction by mine, the result is $\frac{1}{40}$ .<br>A) 0.025 B) 0.25 C) 0.40 D) 2.50  | 30. A |
| 31. Dimensions could be $1 \times 48$ , $2 \times 24$ , $3 \times 16$ , $4 \times 12$ , or $6 \times 8$ , with perimeters 98, 52, 38, 32, and 28.<br>A) $28 = 2(6+8)$ B) $38 = 2(3+16)$<br>C) 58 (impossible) D) $98 = 2(1+48)$  | 31. C |
| 32. Since I have two nickels for every dime, my nickels are worth as much as my dimes, \$3.30.<br>A) \$1.15 B) \$3.30 C) \$6.60 D) \$13.20   | 32. B |
| 33. A) $\frac{27}{63} < \frac{28}{63}$ B) $\frac{54}{117} > \frac{52}{117}$ C) $\frac{72}{153} > \frac{68}{153}$ D) $\frac{18}{27} > \frac{12}{27}$  | 33. A |
| 34. The least multiple of 2, 4, 6, 8 is 24. The multiples of 24 are 24, 48, 72, 96, 120, 144, . . . . The list's first perfect square is 144.<br>A) 64 B) 144 C) 576 D) 2304   | 34. B |
| 35. $4^9 = 2^{18}$ and $9^4 = 3^8$ . A) $81^3$ B) $18^3$ C) $7^8$ D) $3^8$   | 35. D |
| 36. The greatest common factor of 200 and 600 is 200.<br>A) 10 B) $10 \times 10$ C) $10 \times 20$ D) $10 \times 20 \times 30$   | 36. C |
| 37. $\frac{9}{7} \times \frac{7}{8} \times \frac{8}{3} = 3 = \frac{3}{8} \times \frac{8}{7} \times \frac{7}{9} \times 9$ . A) 27 B) 18 C) 9 D) 3   | 37. C |
| 38. Try the choices. Use the formula: Area = $\pi r^2$ . For choice A, Area = $\frac{1}{\pi} = \pi \times (\frac{1}{\pi})^2$ . Thus, a radius of the frisbee is $\frac{1}{\pi}$ .<br>A) $\frac{1}{\pi}$ B) $\frac{1}{2\pi}$ C) $\frac{1}{\pi^2}$ D) $\frac{1}{2\pi^2}$ | 38. A |
| 39. $3^1, 3^2, 3^3, 3^4$ end in 3, 9, 7, 1. This now repeats in blocks of 4. Ones' digit of $2003^{2004}$ is 1.<br>A) 9 B) 7<br>C) 3 D) 1  | 39. D |
| 40. $(\frac{1}{2} + \frac{199}{2}) + (\frac{3}{2} + \frac{197}{2}) + (\frac{5}{2} + \frac{195}{2}) + \dots = 100 + 100 + 100 + \dots = 100 \times 50 = 5000$ .<br>A) 5000 B) 10 000 C) 15 000 D) 20 000  | 40. A |



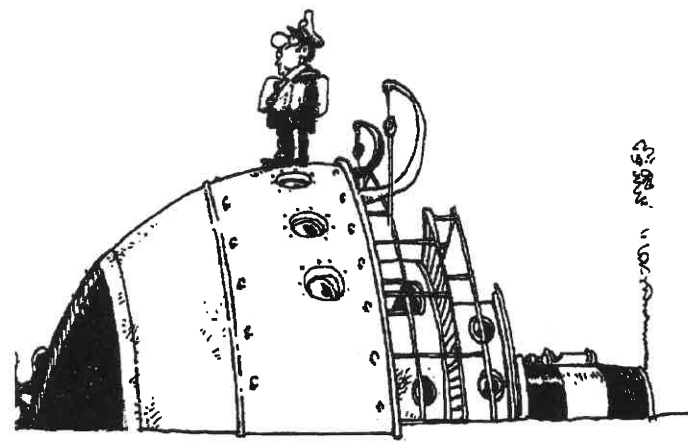
Information & Solutions

Tuesday, February 17 or 24, 2004

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



The end of the contest 7

|       |  |
|-------|--|
| 15. A | 15. 1 hr = 3600 secs; $\frac{1}{100}$ hr = $\frac{3600}{100}$ secs A) $\frac{1}{100}$ B) $\frac{60}{36}$ C) $\frac{36}{1}$ D) $\frac{1}{3600}$   |
| 16. D | 16. $999 \times (183 - 182) = 999$ . A) 1 B) 182 C) 183 D) 999   |
| 17. B | 17. If my sister has 3 brothers and 2 sisters, there are 3 male and 3 female siblings. Each of my brothers has 2 brothers and 3 sisters. A) 2, 2 B) 2, 3 C) 3, 2 D) 3, 3   |
| 18. D | 18. $\frac{4}{9} \times \frac{4}{9} \times \frac{4}{9} = \frac{64}{729}$ . A) $\frac{8}{64}$ B) $\frac{64}{27}$ C) $8\frac{1}{1}$ D) $\frac{64}{729}$  |
| 19. C | 19. The balls are numbered 1, 2, 3, 4, 5, 6, 7, 8, and 9. Since 4 of the 9 balls have even numbers, the probability that I selected was even is $\frac{4}{9}$ . A) $\frac{5}{1}$ B) $\frac{1}{1}$ C) $\frac{9}{4}$ D) $\frac{9}{5}$    |
| 20. B | 20. $\frac{1}{1} + \frac{3}{1} = \frac{6}{5} = 1 \div \frac{5}{6}$ . A) 6 B) $\frac{5}{6}$ C) $\frac{6}{5}$ D) $\frac{5}{1}$   |
| 21. A | 21. Try some: $\frac{1}{2}$ , $\frac{1}{3}$ , $\frac{1}{4}$ , ... , all of which are less than 1. A) less than 1 B) more than 1 C) odd D) negative   |
| 22. C | 22. $100 \times (1/10) = 10 = 1000 \times (1/100)$ . A) 10 B) 100 C) 1000 D) 10000   |
| 23. D | 23. For every performer who throws, four performers smile. So, 4 of every 5 performers smile. This means that $\frac{4}{5}$ of the 80 <i>Bike Teens</i> smile while performing, and $\frac{4}{5}$ of 80 is 64. A) 16 B) 20 C) 60 D) 64 |
| 24. C | 24. $(1+2+3+4) - (\frac{5}{1} + \frac{5}{2} + \frac{5}{3} + \frac{5}{4}) = 10 - \frac{5}{10}$ . A) 0 B) 5 C) 8 D) 10   |
| 25. D | 25. In a $\Delta$ , the sum of any <i>two</i> angles is $< 180^\circ$ , so D is impossible. A) $80^\circ$ B) $90^\circ$ C) $95^\circ$ D) $105^\circ$   |
| 26. B | 26. $\sqrt{4^2} = 4$ , $\sqrt{12^2} = 12$ , $\sqrt{7^2} = 7$ , so $? = 9^2$ . A) $15^2$ B) $9^2$ C) $6^2$ D) $3^2$   |
| 27. C | 27. Since $3 \times 29 = 87$ , the sum of the primes is $3 + 29 = 32$ . A) 20 B) 30 C) 32 D) 42  |
| 28. A | 28. $1\% = 1/100 = 10 \times 1/1000$ . A) 0.001 B) 0.01 C) 0.1 D) 1  |

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|       |  |
|-------|--|
| 1. A  | 1. $(10 + 10) \times (10 - 10) = (10 + 10) \times 0 = 0$ . A) 0 B) 20 C) 190 D) 990  |
| 2. D  | 2. Remainders for 1900, 190, and 19 are 0, 0, and 4; and $0 + 0 + 4 = 4$ . A) 1 B) 2 C) 3 D) 4   |
| 3. D  | 3. $2 + (2 \times 2) + 2 = 2 + (4) + 2 = 8 = 4 + 4 = 2^2 + 2^2$ . A) $(2 + 2)^2$ B) $(2 \times 2)^2$ C) $2^2 \times 2^2$ D) $2^2 + 2^2$                              |
| 4. C  | 4. Smallest difference is $0.90 - 0.89 = 0.01$ , so choice C is closest. A) $0.9 - 0.8 = 0.1$ B) $0.9 - 0.85 = 0.05$ C) $0.9 - 0.89 = 0.01$ D) $0.99 - 0.9 = 0.09$   |
| 5. D  | 5. 30 minutes before 5 P.M. = 4:30 P.M. = 15 minutes after 4:15 P.M. A) 5:15 B) 4:45 C) 4:30 D) 4:15   |
| 6. C  | 6. I won 50% of my tosses, so I won as many tosses as I lost. If I lost 18 times, I also won 18 times. A) 36 B) 27 C) 18 D) 9  |
| 7. C  | 7. $1000 \text{ m} + 10 \text{ m} + 1 \text{ m} = 1011 \text{ m}$ . A) 111 m B) 1010 m C) 1011 m D) 1110 m   |
| 8. B  | 8. $4 + \frac{2}{3} = 4 + 1\frac{1}{3} = \frac{2}{1} + \frac{2}{3} = \frac{4}{3} + \frac{2}{3} = \frac{6}{3} = 2$ . A) $4\frac{1}{2}$ B) 5 C) $5\frac{1}{2}$ D) 6    |
| 9. B  | 9. The multiples are $4 \times 1, 4 \times 2, \dots, 4 \times 24$ . There are 24 multiples. A) 22 B) 24 C) 25 D) 26  |
| 10. D | 10. The total increase is $64 \times 2 = 128$ . A) 2 B) 32 C) 64 D) 128  |
| 11. A | 11. Since $0.25 = \frac{1}{4}$ , multiplying by 0.25 is the same as dividing by 4. A) 4 B) 400 C) 2.5 D) 25  |
| 12. B | 12. The average of 1000 and 2000 is 1500. Then, $2000 - 1500 = 500$ . A) 50 B) 500 C) 1000 D) 1500   |
| 13. B | 13. The volume of a rectangular solid is length $\times$ width $\times$ height. Volume = $3 \times 4 \times 2 = 24$ . A) 99 B) 24 C) 18 D) 9                         |
| 14. A | 14. Since 4 of the 20 volunteers are supervisors, we know that $\frac{4}{20} = \frac{20}{100} = 20\%$ of the volunteers are supervisors. A) 20% B) 25% C) 75% D) 80% |

Go on to the next page 