	Answers
26. Each chemical can be paired with 6 other chemicals for a total of $6 \times 7 = 42$ pairs. However, each pair has been counted twice. So divide by 2: $42 \div 2 = 21$. A) 14 B) 21 C) 42 D) 49	26. B
27. The sum of the digits is 100, which is not divisible by 3 or any multiple of 3. A) 4 B) 6 C) 8 D) 20	27. B
28. Multiply the three smallest primes: $2 \times 3 \times 5 = 30$, whose 8 divisors are 1, 2, 3, 5, 6, 10, 15, and 30. A) 3 B) 5 C) 6 D) 8	28. D
29. $(2^{2000} + 2^{2000}) + (3^{3000} + 3^{3000} + 3^{3000}) = 2 \times 2^{2000} + 3 \times 3^{3000} = 2^{2001} + 3^{3001}$. A) $4^{2000} + 9^{3000}$ B) $2^{4000} + 3^{9000}$ C) $4^{2001} + 9^{3002}$ D) $2^{2001} + 3^{3001}$	29. D
30. I drop my nickels at 0 m, 5 m, 10 m, . . . , 90 m, 95 m, and 100 m. In all, I drop 21 nickels. Finally, the value of all 21 of these nickels is $21 \times 5¢ = \$1.05$. A) \$0.95 B) \$1.00 C) \$1.05 D) \$1.10	30. C
31. Since $31^2 = 961 < 1000 < 32^2 = 1024$, the squares of 1, 2, 3, . . . , 31 are less than 1000. Of these 31 squares, 16 are odd and 15 are even. A) 15 B) 16 C) 30 D) 31	31. A
32. One-half of one-quarter is one-eighth. The area of one-eighth of a square is 8; so the total area is 64, the side-length is 8, and the perimeter is 32. A) 16 B) 32 C) 48 D) 64	32. B
33. $(4+8+12+\ldots+400)-(3+6+9+\ldots+300) = (4-3)+(8-6)+(12-9)+\ldots+(400-300) = 1+2+3+\ldots+100 = (1+100)+(2+99)+\ldots+(50+51) = 50 \times 101 = 5050$. A) 100 B) 400 C) 1200 D) 5050	33. D
34. Write ratios equivalent to 5:3 until a trade yields an 8:7 ratio; 5:3 = 10:6 = 15:9 = 20:12. With 20 clubs and 12 skins, a trade of 4 clubs for 2 skins leaves 16 clubs and 14 skins, which is a 16:14 = 8:7 ratio. A) 8 B) 9 C) 10 D) 12	34. A
35. The 1st 9 remainders are 1, 2, 3, . . . , 8, 0. They repeat 100 times until reaching 999. That's a total of 100×36. Add 1 for 1000. A) 3600 B) 3601 C) 4500 D) 4501	35. B

The end of the contest 6

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Information & Solutions

Tuesday, February 21 or 28, 2012

6

Contest Information

- **Solutions** Turn the page for detailed contest solutions (written in the question boxes) and letter answers (written in the *Answer Column* to the right of each question).
- **Scores** Please remember that *this is a contest, and not a test*—there is no "passing" or "failing" score. Few students score as high as 28 points (80% correct); students with half that, 14 points, *deserve commendation!*
- **Answers and Rating Scales** Turn to page 148 for the letter answers to each question and the rating scale for this contest.

1. Terry played an odd number of notes. Odd numbers have a ones digit of 1, 3, 5, 7, or 9, so 2211 is an odd number.
A) 2012 B) 2211 C) 3456 D) 4664 — **1. B**

2. The average is 10, so the sum is 20; 20−8 = 12.
A) 6 B) 9 C) 12 D) 18 — **2. C**

3. The tens digit of 345 is 4 and the hundreds digit of 456 is 4. Their sum is 8.
A) 8 B) 9 C) 10 D) 11 — **3. A**

4. My vacation starts on May 10 and ends on May 20. Subtract 9 from each—it's the same number of days as from May 1 through May 11.
A) 9 B) 10 C) 11 D) 12 — **4. C**

5. 2 days = 48 hours = (60 × 48) minutes = 2880 minutes.
A) 1440 B) 1660 C) 2000 D) 2880 — **5. D**

6. Multiples of 45 are 45, 90, 135, 180, . . . ; 180 is also a multiple of 12.
A) 57 B) 90 C) 180 D) 540 — **6. C**

7. 72 erasers = 72 ÷ 12 = 6 dozen erasers; 6 dozen cost Dina 6 × 50¢ = $3.
A) $1.50 B) $3.00 C) $30.00 D) $36.00 — **7. B**

8. The only even prime number is 2, so the odd prime number must be 7.
A) 1 B) 5 C) 6 D) 7 — **8. D**

9. The sum of the largest and smallest whole-number divisors of 36 is 36+1.
A) 12 B) 15 C) 20 D) 37 — **9. D**

10. If 160 of 400 drivers are late, then 160 ÷ 400 = 0.40 = 40% are late for work.
A) 20% B) 40% C) 60% D) 80% — **10. B**

11. Since 220 is divisible by both 4 and 5, there are 220/4 = 55 multiples of 4 between 1 and 222, and 220/5 = 44 multiples of 5. Finally, 55 − 44 = 11.
A) 11 B) 22 C) 33 D) 44 — **11. A**

12. 1000 mins = 16 hrs 40 mins. The time is 2:40 A.M.
A) 4:40 P.M. B) 10:00 P.M. C) 2:40 A.M. D) 10:00 A.M. — **12. C**

13. Gil flies 4400 km at 800 km/hour. It will take him (4400 ÷ 800) hours = 5.5 hours to complete his trip.
A) 4 B) 4.5 C) 5 D) 5.5 — **13. D**

Go on to the next page ➠ 6

14. Work backwards and use inverse operations: 30/2 = 15, 15 + 10 = 25, 25 × 2 = 50, and 50 − 10 = 40. Larry's real age is 40.
A) 50 B) 40 C) 30 D) 20 — **14. B**

15. A rectangle has a perimeter of 48. If its width is 6 and its length 18, then its perimeter is 6 + 6 + 18 + 18 = 48.
A) 6 B) 8 C) 12 D) 16 — **15. A**

16. Since 50 quarters = $12.50, and 50 pennies + 50 nickels + 50 dimes = $0.50 + $2.50 + $5.00 = $8.00, I owe her $12.50 − $8.00 = $4.50.
A) $4.50 B) $5.50 C) $6.50 D) $7.50 — **16. A**

17. 8.5 × 7500 = 63750.
A) 63000 B) 63450 C) 63750 D) 64005 — **17. C**

18. Since there are 3 boys for every 4 girls, the total number of students must be a multiple of 3 + 4 = 7, so the answer is 70.
A) 120 B) 70 C) 40 D) 30 — **18. B**

19. If the average is $10, the sum is 5×$10 = $50. Without the fifth friend, the friends had $4 all together. The fifth friend has $50 − $4 = $46.
A) $9 B) $19 C) $46 D) $49 — **19. C**

20. The largest divisor of 180 that is the square of an integer is 36. The smallest divisor of 180 that is the square of an integer is 1; 36 − 1 = 35.
A) 5 B) 27 C) 32 D) 35 — **20. D**

21. Let's try 14 (or any other number that's 3 more than a multiple of 11). When I divide 14 by 11, the remainder is 3. When I divide 4 × 14 = 56 by 11, the remainder is 1.
A) 1 B) 3 C) 7 D) 12 — **21. A**

22. 99 × 88 × 77 × 66 × 55 ÷ (9 × 8 × 7 × 6 × 5) = 11^5.
A) 11 B) 11^4 C) 11^5 D) 11^6 — **22. C**

23. Since 3:5 = 12:20, the largest whole number for which 3:5 < 12: ? is true is 19.
A) 19 B) 20 C) 21 D) 24 — **23. A**

24. 99 ÷ 9 = 11, so the middle number is 11. Numbers are 7, 8, 9, . . . , 14, 15.
A) 9 B) 11 C) 13 D) 15 — **24. D**

25. If my house is between my sister's house and school, and if all three are on a straight line, I could be 5 km from school, but no closer than that.
A) 4 km B) 5 km C) 8 km D) 10 km — **25. A**

Go on to the next page ➠ 6