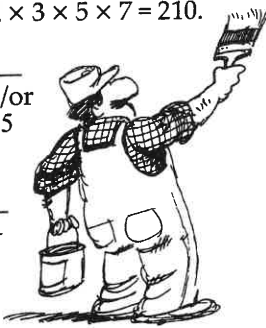


| | |
|---|------------------|
| <p>30. If A, B, and C are on a line, the distance from point A to point C can be 3 cm or 11 cm. Otherwise, the distance from point A to point C is between 3 cm and 11 cm. A) 2 cm B) 3 cm C) 6 cm D) 10 cm</p> | <p>30. A</p> |
| <p>31. Since $S \times RS$ has 3 digits and a ones digit of S, S is 5 or 6. If S is 5, R must be 2 or 3, since the product begins with 1. Only 3 works, since $T > S$. If $S = 6$ and $R = 2$, $T = 5 < S$, which is not allowed. A) 1 B) 4 C) 5 D) 6</p> | <p>31. C</p> |
| <p>32. Can the sides be 10, 10, and 20? No: the sum of the two smaller sides must be greater than the 3rd side. So the sides are 10, 20, and 20; the perimeter is 50. A) 60 B) 50 C) 40 D) 30</p> | <p>32. B</p> |
| <p>33. $\frac{9}{2} - \frac{2}{9} = \frac{81}{18} - \frac{4}{18} = \frac{77}{18}$ A) $\frac{18}{77}$ B) $\frac{14}{18}$ C) $\frac{18}{14}$ D) $\frac{77}{18}$</p> | <p>33. D</p> |
| <p>34. The numbers are the even sums $2+2, 2+4, 2+2, 2+4, 2+6, \dots, 2+196$. There are 98 such sums from 4 to 198. A) 101 B) 100 C) 99 D) 98</p> | <p>34. D</p> |
| <p>35. In 1 hour, the wheel rolls $30 \times 200\pi \text{ m} = 6000\pi \text{ m}$. Its circumference is $(2 \times \pi \times 2) \text{ m} = 4\pi \text{ m}$. It makes $6000\pi \text{ m} \div 4\pi \text{ m} = 1500$ full revolutions. A) 100 B) 200 C) 1500 D) 3000</p> | <p>35. C</p> |
| <p>36. The product must be divisible by 210 because $2 \times 3 \times 5 \times 7 = 210$. A) 210 B) 260 C) 420 D) 520</p> | <p>36. A</p> |
| <p>37. Of 180 paintings, $180 - 25 = 155$ have blue and/or red borders. Since $110 + 90 = 200$, $200 - 155 = 45$ have borders with both colors. A) 25 B) 45 C) 55 D) 65</p> | <p>37. B</p> |
| <p>38. The difference is $(2+4+6+\dots+100) - (1+3+5+\dots+99) = (2-1) + (4-3) + (6-5) + \dots + (100-99) = 1 + 1 + 1 + \dots + 1 = 50$. A) 100 B) 50 C) 25 D) 1</p> | <p>38. B</p> |
| <p>39. Ones digits of powers of 2 cycle 2, 4, 8, 6, 2, 4, 8, 6 ... ; $2009 \div 4$ has R1. A) 2^{2009} B) 2^{2010} C) 2^{2011} D) 2^{2012}</p> | <p>39. A</p> |
| <p>40. Work backwards: Gwen had $\frac{3}{2} \times \\$36 = \\54 before buying clothes. Gwen had $\frac{7}{6} \times \\$54 = \\63 before buying food, so she spent \$9 on food. A) \$24 B) \$18 C) \$12 D) \$9</p> | <p>40. D</p> |



Information & Solutions

2009-2010 Annual 7th Grade Contest

Tuesday, February 16 or 23, 2010

7

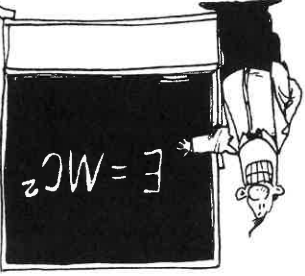
Contest Information

- 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 30 points (75% correct); students with half that, 15 points, *deserve commendation!*
- Answers and Rating Scales** Turn to page 141 for the letter answers to each question and the rating scale for this contest.



The end of the contest 17

| | | |
|-----|---|--|
| 1. | B | There are 25 squares in all, and 5 are shaded. So the percent shaded is $(5 \div 25) \times 100 = 20$. A) 5% B) 20% C) 25% D) 50% |
| 2. | D | Work backwards: $4 \times 18 + 2 = 72 + 2 = 74$. A) 26 B) 56 C) 70 D) 74 |
| 3. | A | 2.345 is closer to 2.3 than it is to 2.4. A) 2.3 B) 2.34 C) 2.35 D) 2.5 |
| 4. | B | The common elements are b and c . A) $\{ \}$ B) $\{b, c\}$ C) $\{a, d\}$ D) $\{a, b, c, d\}$ |
| 5. | C | From 1 to 99 is 99 numbers. Subtract the first 20 numbers to get 79. A) 81 B) 80 C) 79 D) 78 |
| 6. | B | $(8 \times 6 + 2) \div 2 = (48 + 2) \div 2 = 50 \div 2 = 25$. A) $4 \times 3 + 1 = 13$ B) $4 \times 6 + 1 = 25$ C) $4 \times 6 + 2 = 26$ D) $8 \times 6 + 1 = 49$ |
| 7. | B | As shown below, only choice B is a prime number. A) $81 = 9 \times 9$ B) 83 C) $87 = 3 \times 29$ D) $99 = 9 \times 11$ |
| 8. | C | 1% of $\$2010 = 0.01 \times \$2010 = \$20.10$. A) $\$0.201$ B) $\$2.01$ C) $\$20.10$ D) $\$201.00$ |
| 9. | A | $\sqrt{36} - \sqrt{25} = 6 - 5 = 1 = \sqrt{1}$. A) $\sqrt{1}$ B) $\sqrt{11}$ C) $\sqrt{14}$ D) $\sqrt{16}$ |
| 10. | D | There are 40 quarters in a roll. Each sister's share is $40 \div 8 = 5$, so three sisters take 15 coins, leaving 25 quarters in the roll. The value of these 25 quarters is $25 \times 25¢ = \$6.25$. A) $\$0.15$ B) $\$1.25$ C) $\$3.75$ D) $\$6.25$ |
| 11. | A | $2^4 + 2^4 = 16 + 16 = 32 = 2^5$. A) 2^5 B) 4^8 C) 4^4 D) 2^8 |
| 12. | C | A hexagon has 6 sides and an octagon has 8 sides. The ratio is $6:8 = 3:4$. A) 7:8 B) 5:6 C) 3:4 D) 1:2 |
| 13. | D | The average is $\left(1 + \frac{1}{3}\right) \div 2 = \frac{6}{5} \times \frac{1}{2} = \frac{6}{10} = \frac{3}{5}$. A) $\frac{6}{5}$ B) $\frac{5}{2}$ C) $\frac{6}{1}$ D) $\frac{12}{5}$ |
| 14. | A | $(3 \times 2 \times 6 \times 2 \times 9 \times 2 \times 12 \times 2) \div (3 \times 6 \times 9 \times 12) = 2 \times 2 \times 2 \times 2 = 16$. A) 16 B) 8 C) 2 D) 0 |
| 15. | D | A circle's radius, r , divided by its circumference, $2\pi r$, has quotient $1/(2\pi)$. A) 2π B) π C) $\frac{\pi}{1}$ D) $\frac{1}{2\pi}$ |



| | | |
|-----|---|---|
| 16. | D | Use estimation: $24 \div 0.5 = 48$. A) 12 B) 24 C) 36 D) 48 |
| 17. | B | Find two numbers whose product is 40 and whose sum is 14. The numbers are 4 and 10, so the length of the longest side is 10. A) 12 m B) 10 m C) 8 m D) 5 m |
| 18. | C | 300% of 30 = $3.00 \times 30 = 90$. A) 0.9 B) 9 C) 90 D) 9000 |
| 19. | C | Rewrite each fraction with a denominator of 3000. A) $\frac{1000}{3000}$ B) $\frac{1050}{3000}$ C) $\frac{990}{3000}$ D) $\frac{1001}{3000}$ |
| 20. | A | If 2 cm represent 6000 km, 1 cm represents 3000 km, and 0.1 cm represent 300 km. A) 0.1 B) 0.5 C) 10 D) 20 |
| 21. | C | All angles in an equilateral triangle are congruent, so $m\angle C = 60$. Thus, $m\angle A + m\angle B = 180 - 60 = 120$. A) 60 B) 90 C) 120 D) 180 |
| 22. | D | Since $300 \div 26$ has a quotient of 11 and a remainder of 14, the 300th letter written is the 14th one from the beginning of the alphabet, N. A) K B) L C) M D) N |
| 23. | A | The sum of Lana's first 4 grades is $4 \times 75 = 300$. The sum of her first 5 is $5 \times 80 = 400$. Her score on the 5th test is the difference: $400 - 300 = 100$. A) 100 B) 95 C) 85 D) 80 |
| 24. | B | $10 \text{ m} + 10 \text{ cm} = 10 \text{ m} + 0.1 \text{ m} = 10.1 \text{ m}$. A) 11 m B) 10.1 m C) 10.01 m D) 10.001 m |
| 25. | D | $18:12 = 3:2 = (3 \times 12):(2 \times 12) = 36:24$. A) 2:3 B) 16:10 C) 12:18 D) 36:24 |
| 26. | C | $45^3 = (3^2 \times 5)^3 = 3^2 \times 3^2 \times 3^2 \times 5 \times 5 \times 5 = 3^6 \times 5^3$. A) $3^3 \times 5^3$ B) $4^3 \times 5^3$ C) $3^6 \times 5^3$ D) $3^8 \times 5^3$ |
| 27. | B | $(4 + 52)$ minutes after 10:56 AM is 11:52 AM. A) 10:00 AM B) 11:52 AM C) 11:56 AM D) 12:02 PM |
| 28. | D | The square of the reciprocal is $\frac{9}{1}$, so the square of the number is 9, the number is 3, and the number's cube is $3^3 = 3 \times 3 \times 3 = 27$. A) $\frac{1}{27}$ B) $\frac{1}{1}$ C) 9 D) 27 |
| 29. | C | It goes 240 000 m in 60 mins, 4000 m in 1 min, 2000 m in 30 seconds. A) 2 B) 8 C) 2000 D) 8000 |

