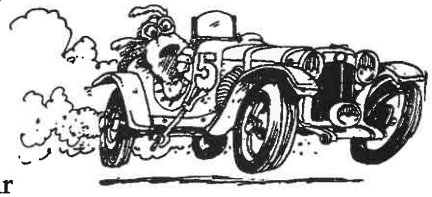
	Answers
30. Add 1 to each perfect square < 200 to get 2, 5, 10, 17, 26, 37, 50, 65, 82, 101, 122, 145, 170, 197. The 6 primes are 2, 5, 17, 37, 101, 197. A) 5 B) 6 C) 9 D) 14	30. B
31. Triple in 18 yrs ⇒ double in half that, 9 years, Pat's current age. A) 9 years B) 12 years C) 18 years D) 24 years	31. C
32. Median is the average of $\frac{1}{4}$ and $\frac{1}{5} = \left(\frac{1}{4}+\frac{1}{5}\right)\div 2 = \frac{9}{20}\div 2 = \frac{9}{40}$. A) $\frac{1}{9}$ B) $\frac{1}{4.5}$ C) $\frac{1}{3}$ D) $\frac{9}{40}$	32. D
33. In a poll of more than 1 million people, exactly 16⅔% = 1/6 felt run-down. The only choice that's divisible by 6 is choice C. A) 2 B) 4 C) 6 D) 8 	33. C
34. $\frac{35}{4}$ cm $= \frac{35}{4}\div 100$ m $= \frac{35}{400}$ m $= \frac{7}{80}$ m. A) $\frac{1}{25}$ B) $\frac{7}{80}$ C) $\frac{4}{35}$ D) $\frac{35}{4}$	34. B
35. $\sqrt{\sqrt{81}} = \sqrt{9} = 3 = (\sqrt{3})^2$. A) $\sqrt{3}$ B) 3 C) $3\sqrt{3}$ D) 9	35. A
36. The reciprocal of 1 is 1. The least possible such sum is 1+1 = 2. A) 2.5 B) 2 C) 1 D) 0	36. B
37. The sum of any 3 consecutive integers is divisible by 3. Only choice B is divisible by 3. The side-lengths would be 666, 667, 668. A) 2000 B) 2001 C) 2002 D) 2003	37. B
38. $\left(\frac{1}{2}\times\frac{1}{3}\right)\div(2\times 3) = \left(\frac{1}{2}\times\frac{1}{3}\right)\times\left(\frac{1}{2}\times\frac{1}{3}\right) = \left(\frac{1}{2}\times\frac{1}{3}\times\frac{1}{2}\right)\times\left(\frac{1}{3}\right) = \frac{1}{12}\times\frac{1}{3}$. A) $\frac{1}{12}$ B) $\frac{1}{72}$ C) 3 D) 36	38. A
39. In 1 hour, I drive 40 km. If I want to drive 60 km in a half-hour, I must triple my speed to 120 km/hr. A) 60 km/hr B) 80 km/hr C) 120 km/hr D) 160 km/hr 	39. C
40. The 30 even factors are $2^a\times 3^b$, $a = 1, 2, 3, 4, 5$, while $b = 0, 1, 2, 3, 4, 5$. A) 5 B) 6 C) 25 D) 30	40. D

The end of the contest 7

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MATH

SEVENTH GRADE MATHEMATICS CONTEST

Math League Press, P.O. Box 17, Tenafly, New Jersey 07670-0017

Information & Solutions

Tuesday, February 19 or 26, 2002

7

Contest Information

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

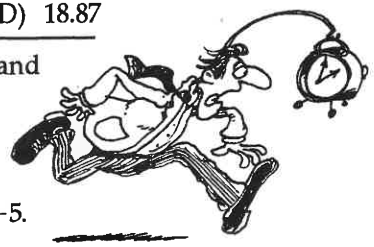
Answers

1. $50 + 100 + 150 + 200 = 500 = 4 \times 125$. — **1. C**
   A) 75 B) 100 C) 125 D) 133

2. I began with 68 dimes, worth \$6.80. Altogether, the ten piles could have 10, 20, 30, 40, 50, or 60 dimes. Subtracting each from 68 dimes, I'd have 58, 48, 38, 28, 18, or 8 dimes left over, respectively. — **2. D**
   A) 12 B) 24 C) 36 D) 48

3. Sum = 9.879. Thousandths' digit is 9, so round the 7 to 8 to get 9.88. — **3. C**
   A) 1.89 B) 9.879 C) 9.88 D) 18.87

4. 12 hrs before midnight is noon, and 5 hrs before noon is 7 A.M. — **4. B**
   A) 5 A.M. B) 7 A.M.
   C) 5 P.M. D) 7 P.M.



5. $4^2+2^2 = 16+4 = 20 = 25-5 = 5^2-5$. — **5. D**
   A) 1 B) 2 C) 4 D) 5

6. $A = 10^{10}$, $B = 10^3$, $C = 10^2$, and $D = 10^1$, so choice A is the largest. — **6. A**
   A) 10^{10} B) 10×100 C) 10×10 D) 10×1^{10}

7. $3^3+3^2+3^1 = 27+9+3 = 39 = 3 \times 13$. A) 3×5 B) 3×6 C) 3×11 D) 3×13 — **7. D**

8. A diagonal connects opposite corners, so you get 2 triangles. — **8. A**
   A) triangles B) rhombuses C) squares D) rectangles

9. $\frac{1}{2} \times 1$ day $= \frac{1}{2} \times (\frac{1}{7} \times 1$ week$)$. A) $\frac{1}{7}$ B) $\frac{2}{7}$ C) $\frac{1}{14}$ D) $\frac{1}{28}$ — **9. C**

10. Ten million ÷ 100 thousand = 10 000 000 ÷ 100 000 = 100. — **10. B**
    A) 10 B) 100 C) 1000 D) 10 000

11. One ream has 500 sheets; 20 reams have $20 \times 500 = 10\,000$ sheets. — **11. D**
    A) 25 sheets B) 500 sheets C) 1000 sheets D) 10 000 sheets

12. The respective hundredths' digits of A, B, C, D are 8, 9, 6, 0. — **12. B**
    A) 79.68 B) 86.79 C) 97.86 D) 678.9

13. $111 \times 1000 = 111\,000$ has 6 digits, and 111×999 is just 111 less. — **13. A**
    A) 6 B) 5 C) 4 D) 3

14. 40 is 30 more than 10, which is 40 less than 50. — **14. B**
    A) 70 B) 50 C) 30 D) 10

15. The 4 math books and 1 cookbook were non-fiction, so 5 of the 8 books, or 62.5% of the books, were non-fiction. — **15. D**
    A) 37.5% B) 50%
    C) 60% D) 62.5%

Answers

16. Since the square root of the perimeter of the square is 6, the perimeter is $6^2 = 36$, a side is $36 \div 4 = 9$, and the area is $9^2 = 81$. — **16. C**
    A) 36 B) 64 C) 81 D) 144

17. When I sell 33 flags at 3 for \$1 and the last 2 flags for 75¢, I charge \$11.75. When I sell 35 flags in any other way, I charge more. — **17. A**
    A) \$11.75 B) \$11.90
    C) \$12.00 D) \$14.00

18. $2 \times 500 + 2 \times 501 = 1000 + 1002 = 2002 = 2 \times 1001 = 2 \times (500 + 501)$. — **18. B**
    A) $2 + (500 \times 501)$ B) $2 \times (500 + 501)$
    C) $(2 + 2) \times (500 + 501)$ D) $(2 \times 2) + (500 \times 501)$

19. The reciprocal of a product is the product of all the reciprocals. — **19. D**
    A) $\frac{3}{8} \times \frac{13}{18}$ B) $\frac{3}{13} \times \frac{8}{18}$ C) $\frac{8}{3} \times \frac{18}{13}$ D) $\frac{3}{8} \times \frac{18}{13}$

20. Side-length = perimeter ÷ (# of sides); for a △, side-length = $36 \div 3$. — **20. A**
    A) a triangle B) a square C) a rhombus D) a hexagon

21. The even whole number factors of 36 are 2, 4, 6, 12, 18, and 36. — **21. B**
    A) 5 B) 6 C) 7 D) 8

22. To inc the avg of 20 #s by 2, increase each by 2, sum by $20 \times 2 = 40$. — **22. D**
    A) 2 B) 10 C) 22 D) 40

23. $\frac{2+3+4}{8+9+10} = \frac{9}{27} = \frac{1}{3} = \frac{8}{24} = \frac{8}{(8-1)+(9-1)+(10-1)}$. — **23. C**
    A) 4 B) 6 C) 8 D) 9

24. If 5 scoops weigh 2 kg, then 1 scoop weighs 2/5 kg, and 13 scoops weigh $13 \times 2/5 = 26/5$ kg. — **24. C**
    A) $\frac{13}{10}$ kg B) 5 kg C) $\frac{26}{5}$ kg D) 7 kg

25. Since $\sqrt{4} + \sqrt{16} = 6$, choice B is correct. — **25. B**
    A) $\sqrt{12} \approx 3.5$ B) $\sqrt{20} \approx 4.5$ C) $\sqrt{64} = 8$ D) $\sqrt{100} = 10$

26. $\frac{1}{4}$ of $\frac{1}{4}\% = (\frac{1}{4} \times \frac{1}{4})\%$. A) $\frac{1}{16}\%$ B) $\frac{1}{8}\%$ C) $\frac{1}{4}\%$ D) 1% — **26. A**

27. Area $= \pi r^2 = \pi$ cm^2; so $r^2 = 1$ cm^2, $r = 1$ cm, and $d = 2 \times r = 2$ cm. — **27. D**
    A) π cm B) 2π cm C) 1 cm D) 2 cm

28. The greatest common factor of $\sqrt{16} = 4$ and $\sqrt{64} = 8$ is 4. — **28. C**
    A) 16 B) 8 C) 4 D) 2

29. Each congruent triangle has 1/4 the area of the square. The area of the square is $6^2 = 36$, so the area of one triangle is $36 \div 4 = 9$. — **29. B**
    A) 6 B) 9 C) $9\sqrt{2}$ D) 18