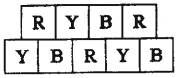
	Answers
30. Each side of the square is 12. Subtract 36π (circle's area) from 144 (square's area) to get choice D.  A) $36-12\pi$ B) $144-12\pi$ C) $36-36\pi$ D) $144-36\pi$	30. D
31. The average value of all 1999 quotients is the value of the middle quotient, whose value is $1000 \div 2 = 500$. A) 498.5 B) 499 C) 499.5 D) 500	31. D
32. $a = 3, b = 4$, so $3\triangle 4 = 4^3+(3\times4) = 64+12 = 76$. A) 76 B) 84 C) 88 D) 93	32. A
33. Since your piggy bank had three times as many coins as mine, we count your coins three times and my coins once. Taken together, the % that are dimes is $(70\%+75\%+75\%+75\%)\div4 = 73.75\%$. A) 72.5 B) 73.25 C) 73.75 D) 74 	33. C
34. The lcm of 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 is $5\times7\times8\times9 = 2520$. A) 3 628 800 B) 7560 C) 2520 D) 1260	34. C
35. $1000^{1001}-1000^{1000} = 1000^{1000}\times(1000^1-1) = 1000^{1000}\times999$. A) 1000 B) 999^{1000} C) 1000×1001 D) 999×1000^{1000}	35. D
36. The sum of 5 primes is odd, so all 5 primes must be odd. Since 1 is not a prime, the sum of the 5 primes could be $3+5+7+11+13 = 39$. A) 39 B) 35 C) 27 D) 25 	36. A
37. If the measures of the angles of a triangle are 3 different numbers, each side has a different length. A) scalene B) obtuse C) isosceles D) equilateral	37. A
38. If the square root of the perimeter of the triangle is 6, then the perimeter is $6^2 = 36$, and the length of each side is $36\div3 = 12$. A) 8 B) 9 C) 12 D) 16	38. C
39. The sum of the digits of $10^{200}+2 = 100\ldots002$ is $1+2 = 3$. A) $10^{200}+1$ B) $10^{200}+2$ C) $10^{200}+3$ D) $10^{200}+4$	39. B
40. Coloring the squares red, yellow, and blue, as illustrated, shows how to use 3 colors. A) 2 B) 3 C) 4 D) 5 	40. B

The end of the contest 8

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MATH

EIGHTH GRADE MATHEMATICS CONTEST

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

Information & Solutions

Tuesday, February 20 or 27, 2007

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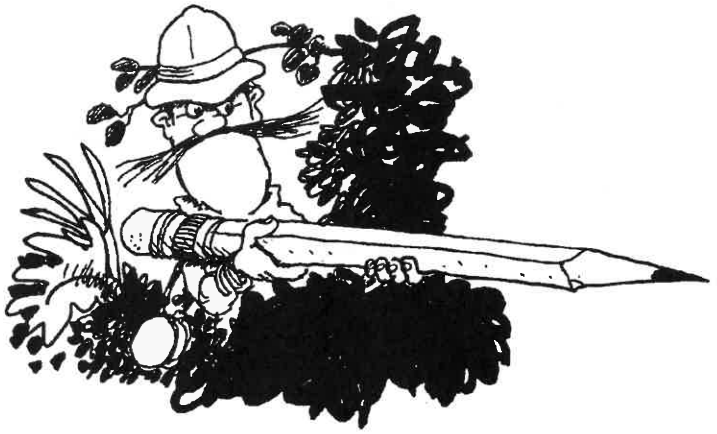
Contest Information

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



	Answers
1. Of the following, choice D has the least value. A) $\frac{2}{3} = 0.666...$ B) $\frac{3}{5} = 0.600$ C) $\frac{4}{7} = 0.571...$ D) $\frac{5}{9} = 0.555...$	1. D
2. 27 fifty-cent stamps cost \$13.50. I got \$6.50 change from \$20. A) \$18.65 B) \$13.50 C) \$10.35 D) \$6.50	2. D
3. The product is 0 since one factor is $\frac{0}{1} = 0$. A) 1 B) $\frac{1}{5}$ C) 0 D) $-\frac{1}{5}$	3. C
4. July 1 is Friday, so the 8th, 15th, 22nd, and 29th are Fridays too. July 31 is 2 days later, a Sunday. A) Saturday B) Sunday C) Monday D) Tuesday	4. B
5. $(10\times0.1)\times(100\times0.01)\times(1000\times0.001) = 1\times1\times1 = 1$. A) 1 B) 0.1 C) 0.01 D) 0.001	5. A
6. The 99 smallest positive integers are 1, 2, 3, . . . , 99. The 99 largest negative integers are –1, –2, –3, . . . , –99. The sum is 0. A) 0 B) 4950 C) 9900 D) 10 000	6. A
7. Since I saved $90 = 3\times30$ nickels, I saved $2\times30 = 60$ dimes. A) 15 B) 30 C) 60 D) 90	7. C
8. $\frac{1}{2}+\frac{3}{4} = \frac{2}{4}+\frac{3}{4} = \frac{5}{4}$. A) 4 B) 6 C) 7 D) 12	8. A
9. $m\angle O > 90°$ and $m\angle A < 90°$, so $m\angle O - m\angle A$ can *never* equal 0°. A) 90° B) 89° C) 1° D) 0°	9. D
10. 120 times in 15 minutes averages $120 \div 15 = 8$ times each minute, or $3\times8 = 24$ times in 3 minutes. A) 8 B) 12 C) 24 D) 30	10. C
11. $(1/10) - (1/100) = 0.1 - 0.01 = 0.10 - 0.01 = 0.09$. A) 0.9 B) 0.09 C) 0.10 D) 10	11. B
12. Given $= 100\,000^2 \div (100\times1000) = 100\,000$. A) 100 000 B) 10 000 C) 10 D) 1	12. A
13. Odd factors of 2007: greatest = 2007; least = 1; difference = 2006. A) 666 B) 668 C) 2004 D) 2006	13. D
14. 9 tenths + 9 hundredths – 9 thousandths = 0.9 + 0.09 – 0.009 = 0.981. A) 0.9901 B) 0.981 C) 0.99 D) –0.901	14. B
15. 1 + 1/1 = 2, so not B or C; and –3 + 1/(–3) = –10/3, so not D. A) 0 B) 2 C) positive D) negative	15. A

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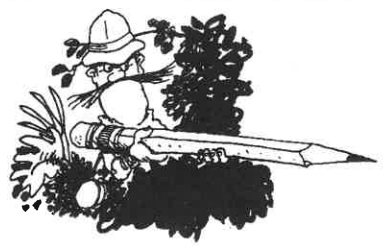
	Answers
16. Divisibility by 12 and 21 implies divisibility by 4, 7, and $4\times7 = 28$. A) 28 B) 33 C) 36 D) 63	16. A
17. The average of *any* two numbers always equals half their sum. A) sum B) product C) quotient D) difference	17. A
18. Factoring, $2^2+2^2\times2^2+2^2\times2^2 = 2^2\times(1+2^2+2^2) = 2^2\times9$. A) 5 B) 6 C) 9 D) 16	18. C
19. Since $120\times30 = 3600 = 60^2$, choice D is correct. For no other choice is the product a square. A) 6 B) 10 C) 15 D) 30	19. D
20. 0.1 + 0.01 + 0.001 = 0.111 = 111 thousandths. A) 1 B) 11 C) 100 D) 111	20. D
21. Half of 0.5% = 0.25% = $5\times0.05\%$. A) 5% B) 0.05% C) 0.005% D) 0.0005%	21. B
22. In 15 hours, at 1 cm/hr., it burns out; at 0.5 cm/hr., it burns halfway. A) 3.75 hours B) 7.5 hours C) 15 hours D) 22.5 hours	22. C
23. Top face + front face + side face = $(1\times2) + (1\times3) + (2\times3) = 11$. The sum of the areas of all six faces is 22. A) 6 B) 11 C) 22 D) 36	23. C
24. $\frac{1}{1+\frac{1}{2}} = \frac{1}{\frac{3}{2}} = 1\div\frac{3}{2} = 1\times\frac{2}{3} = \frac{2}{3}$. A) 1 B) 2 C) 3 D) 4	24. C
25. $(1/8)\times(1/8) = 1/64 = (1/4)\times(1/16)$ = one-fourth of one-sixteenth. A) one-sixteenth B) one-fourth C) one-third D) one-half	25. B
26. Each side of a regular pentagon is 1/5 (or 20%) of its perimeter. A) pentagon B) hexagon C) octagon D) decagon	26. A
27. $30 = 2\times3\times5$ has these factors: 1, 2, 3, 5, 6, 10, 15, 30. A) 4 B) 6 C) 7 D) 8	27. D
28. If the average of 9 numbers is 10, their sum is $9\times10 = 90$. A) 14 B) 19 C) 80 D) 90	28. D
29. Since 1 CD at full price costs \$16, 4 CDs on sale cost $3\times\$16 = \$48$. Thus, 1 CD on sale costs \$12, and 9 CDs on sale cost $9\times\$12 = \$108$. A) \$144 B) \$108 C) \$72 D) \$48	29. B



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