


29. $2^{10} \times 2^{10} = 2^{10+10} = 2^{20}$. A) 2^{20} B) 2^{100} C) 4^{20} D) 4^{100}	29. A
30. Divide by 60 to get # minutes. Repeat to get # hours. Divide result by 24 to get # days ≈ 11.57 . A) January 11 B) January 12 C) February 1 D) February 2	30. B
31. As in 29 above, $16^8 \times 16^8 = 16^{16}$, so $\sqrt{16^{16}} = 16^8$. A) 4^4 B) 4^8 C) 16^4 D) 16^8	31. D
32. If 2005 fractions each have an even numerator and an odd denominator of 1, their product would be an even integer. A) even B) odd C) prime D) 2005	32. A
33. In a \triangle , the sum of the 2 smaller side-lengths must be greater than the 3rd side-length. Thus, the perimeter $\leq 3+4+6 = 13$. A) 11 B) 12 C) 13 D) 14	33. C
34. $10\,000^{9999} = (10^4)^{9999} = 10^{39\,996}$. That's 1 followed by 39 996 zeroes! A) 9999 B) 10 000 C) 39 996 D) 39 997	34. D
35. The 2 small and 2 large \triangle s are shown: A) 2 B) 3 C) 4 D) 5	35. C
36. The 2000 integers $-999, -998, \dots, 998, 999, 1000$ have a sum of 1000. The digit-sum of the largest integer used is $1+0+0+0 = 1$. A) 1 B) 2 C) 9 D) 27	36. A
37. The 9 factors divisible by 4 are 4, 8, 16, 20, 40, 80, 100, 200, & 400. A) 4 B) 8 C) 9 D) 10	37. C
38. Notice that $0^2 = 0$ and that $1^2 = 1$. These are the only two integers which are equal to their own squares. A) zero B) one C) two D) three	38. C
39. The hr. hand moves 30° in 1 hr. and $(22/60) \times 30^\circ = 11^\circ$ in 22 mins. A) 10° B) 11° C) 21° D) 22°	39. B
40. The product includes several multiples of 10; it's divisible by 100. A) 4 B) 6 C) 8 D) 0	40. D

The end of the contest  **8**

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Information & Solutions

2004-2005 Annual 8th Grade Contest

Tuesday, February 22 (alternate date: February 15), 2005

Directions for Grading

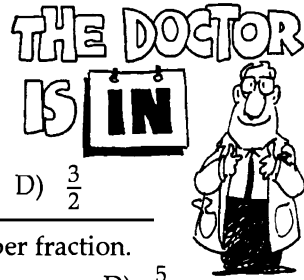
8

- Security and Solutions** Do not look at these solutions until after the contest. Detailed solutions appear in each question box, and letter answers are in the *Answers* columns on the right. You may copy this solution key and give a copy to every student who took this contest.
- Urgent questions?** Call 1-201-568-6328.
- 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, *should be commended!*
- Awards & Results** The original contest package contained 5 *Certificates of Merit*—1 each for the highest scoring student on each grade level, plus extras for ties. Do you need more *Certificates of Merit*? If so, include your name, school, and school mailing address in a letter to: **Math Certificates, P.O. Box 17, Tenafly, NJ 07670-0017**, and include a self-addressed, stamped envelope (2 stamps required) large enough to hold certificates. Only score reports postmarked by Fri., Feb. 25, 2005, and received by Tues., Mar. 9, 2005 can be used in our *Summary of Contest Results* newsletter, which you'll receive no later than Tues., May 10, 2005.
- Return of Student Papers** *Originals* of contest papers with scores of 30 or more *must* be held until June 1. *Copies* of these papers, and originals of all other papers, should be returned to students after grading. Students scoring 30 points or more must confirm an *understanding* of the contest rules by signing the *Selected Math League Rules* (on the colored sheet of information and rules that accompanied the contests). Keep this signed sheet with the original contests until June 1. Please do not mail these to the League unless we ask you to do so.

Fifteen books of past contests, *Grades 4, 5, & 6 (Vols. 1, 2, 3, 4, 5)*, *Grades 7 & 8 (Vols. 1, 2, 3, 4, 5)*, and *High School (Vols. 1, 2, 3, 4, 5)*, are available, for \$12.95 per volume (\$15.95 Canadian), from Math League Press, P.O. Box 17, Tenafly, N.J. 07670-0017.

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1. Subtract 1000 from each: $110 - 020$. A) 102 B) 101 C) 90 D) 20
2. Each side of the square has length $4 \div 4 = 1$. The square's area = $1^2 = 1$.
A) 1 B) 4 C) 8 D) 16
3. $300 \div 200 = 3/2 = 1 \times (3/2) = 1 \div (2/3)$.
A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{3}{2}$
4. Five-fourths = $5/4$, which is an improper fraction.
A) $\frac{4}{5}$ B) $1\frac{1}{4}$ C) 1.25 D) $\frac{5}{4}$
5. $(2005 - 2005) - 2004 = -2004$. A) 1 B) -2004 C) -2005 D) -2006
6. 120 seconds = 2 minutes, so the time is 12:02 A.M.
A) 12:02 P.M. B) 12:02 A.M. C) 2 P.M. D) 2 A.M.
7. $24 \div 4 \times 2 + 4 = [(24 \div 4) \times 2] + 4 = (6 \times 2) + 4 = 12 + 4 = 16$.
A) 1 B) 7 C) 16 D) 36
8. $\frac{1}{2} \times 4 = 2$, so its reciprocal is $\frac{1}{2} = 2 \times \frac{1}{4}$.
A) $2 \times \frac{1}{4}$ B) $\frac{1}{2} \times 4$ C) $\frac{1}{2} \times \frac{1}{4}$ D) 2×4
9. $1.000 - 0.995 = 0.005$; $1.000 - 0.990 = 0.010$;
 $1.010 - 1.000 = 0.010$; $1.100 - 1.000 = 0.100$.
A) 0.995 B) 0.99 C) 1.01 D) 1.1
10. By definition, 1 is *not* a prime, so the sum is $2 + 3 + 5 + 7 = 17$.
A) 15 B) 16 C) 17 D) 18
11. $2 \times \frac{1}{2} \times 4 \times \frac{1}{4} \times 6 \times \frac{1}{6} = (2 \times \frac{1}{2}) \times (4 \times \frac{1}{4}) \times (6 \times \frac{1}{6}) = 1 \times 1 \times 1 = 1$.
A) 1 B) 6 C) 12 D) 24
12. The sum of the measures of each possible pair of angles is 120° , so each angle is 60° . Therefore, triangle *T* must be equilateral.
A) scalene B) right C) obtuse D) equilateral
13. If Sunday is cloudy, then Tuesday, Thursday, and Saturday may also be cloudy. I wear my headphones at most 4 times in a week.
A) 3 B) 4 C) 5 D) 6
14. Of the choices below, D has the largest value.
A) 7 B) $(-1)^2 = 1$ C) $(-2)^2 = 4$ D) $(-3)^2 = 9$
15. $9000\% + 900\% + 90\% + 9\% = 90 + 9 + 0.9 + 0.09 = 99.99$.
A) 9999 B) 999.9 C) 99.99 D) 0.9999



16. A dealer paid Bunny Fabergé 50¢ for each of his eggs. The dealer then sold each egg for 50 quarters. For each penny Fabergé got, the dealer got 25¢, so Fabergé got 4¢ on the dollar, which is 4%.
A) 2% B) 4% C) 25% D) 50%
17. Since $\sqrt{256} = 16$, $\sqrt{\sqrt{256}} = \sqrt{16} = \sqrt{4} = 2$.
A) 2 B) 4 C) 8 D) 16
18. $0.3 \times 0.4 = 0.12$. A) 12% B) 120% C) 1200% D) 12000%
19. The 4 whole numbers factors of 10 are 1, 2, 5, and 10.
A) 30 B) 24 C) 12 D) 10
20. $1/5 = 0.2 < 0.33 < 0.4 = 2/5$; 0.33 closer to $2/5$.
A) 0.2 B) 0.3 C) $\frac{2}{5}$ D) $\frac{3}{5}$
21. I had 4 pennies; need 3 coins = 45¢, so I need 1 quarter; 2 coins = 20¢ are 2 dimes.
A) 0 B) 1 C) 2 D) 7
22. $1.5 \text{ m} + 60 \times 0.01 \text{ m} + 0.02 \times 1000 \text{ m} = 22.1 \text{ m}$.
A) 0.221 m B) 2.21 m C) 22.1 m D) 221 m
23. There are four even factors of 222. They are 2, 6, 74, and 222.
A) 111 B) 4 C) 3 D) 1
24. The average of 1, 2, . . . , 98, 99 is the middle number, 50.
A) 49.00 B) 49.50 C) 49.75 D) 50.00
25. In the large circle, if $r = 2$, then the large circle's area would be 4π . Small circle then has $r = 1$, so $A = \pi$. That's 25% of 4π .
A) 20 B) 25 C) 40 D) 50
26. If $2/3$ cup of fish food feeds 8 goldfish, then $1/3$ cup feeds 4 fish, and 1 cup feeds 12 fish. Thus, 4 cups feed 48 fish.
A) 12 B) 24 C) 36 D) 48
27. The square of an odd number is always odd.
A) prime B) odd C) even D) zero
28. Since the reciprocal of $\frac{1}{x^3}$ is x^3 , $4x = x^3$. The value $x = 2$ works.
A) $\frac{1}{8}$ B) $\frac{1}{2}$ C) 2 D) 8

