

30. As shown below, the sum can be 14, 30, or 102, but not 52.
 A) $14 = 5+5+4$ B) $30 = 25+4+1$ C) 52 D) $102 = 100+1+1$

31. Since $5 = 2+3$, $7 = 2+5$, and $8 = 3+5$, the numbers 5, 7, and 8 can be written as a sum of two primes. [Note: 1 is not prime.]
 A) 3 B) 2 C) 1 D) none

32. Right now, Pat is 8 years younger than Lee. In 5 years, Pat will be 8 and Lee will be 16. Lee is $16-5 = 11$ right now.
 A) 16 B) 11 C) 5 D) 3



33. $0.02 \times 0.02 = 0.0004 = 0.04 \times 0.01$.
 A) 10 B) 1 C) 0.1 D) 0.01

34. If the surface area is 24, each face's area is 4 and the length of each edge is 2. The volume is $2^3 = 8$. Each small cube's volume is 1.
 A) 1 B) 3 C) 6 D) 8

35. If a and c are < 0 , a^3 and c^5 are < 0 , but their product is > 0 .
 A) a B) c C) both a & c D) both b & c

36. $(2 \times 2)^8 = 2^8 \times 2^8 = 2^{16}$. $(2 \times 2 \times 2)^4 = 2^4 \times 2^4 \times 2^4 = 2^{12}$. GCF is 2^{12} .
 A) 2^{64} B) 2^{16} C) 2^{12} D) 2^4

37. After Dad bought $3/5$ of the fish that I caught, he gave away $1/4$ of these fish and kept $3/4$ of them. The fraction of my fish that Dad kept was $3/4$ of $3/5 = 9/20$.

A) $\frac{3}{20}$ B) $\frac{4}{20}$ C) $\frac{7}{20}$ D) $\frac{9}{20}$



38. The only 2-digit multiple of 5 that's 5 times the sum of its digits is 45.
 A) 10 B) 20 C) 30 D) 40

39. The 8 factors are 1×9 , 2×9 , 3×9 , 5×9 , 6×9 , 10×9 , 15×9 , and 30×9 .
 A) 7 B) 8 C) 29 D) 30

40. Label the squares as shown. There are only 6 possible paths. These paths are 1-2-3-6-9, 1-2-5-6-9, 1-2-5-8-9, 1-4-5-6-9, 1-4-5-8-9, and 1-4-7-8-9.
 A) 4 B) 6 C) 8 D) 12

1	2	3
4	5	6
7	8	9

30. C
 31. A
 32. B
 33. D
 34. A
 35. C
 36. C
 37. D
 38. B
 39. B
 40. B



Information & Solutions

Tuesday, February 19 or 26, 2008

Contest Information

8

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



The end of the contest 8

1.	A	1. $(10 + 70) + (20 + 60) + (30 + 50) = 80 + 80 + 80 = 80 \times 3$.
2.	D	2. Check only divisibility by 16. This assures divisibility by 2, 4, and 8. A) 1624 B) 2461 C) 3218 D) 4816
3.	C	3. 0.05×0.01 has a total of 4 decimal places, as does 0.5×0.001 . A) 01 B) 0.01 C) 0.001 D) 0.0001
4.	C	4. Since the perimeter is 1, the average of the side-lengths is $\frac{3}{4}$. A) 1 B) $\frac{6}{1}$ C) $\frac{1}{1}$ D) 3
5.	B	5. If Fido scored 6 points every 12 minutes, then he scored 6×6 points = 36 points in 6×12 minutes = 72 minutes = 1.2 hours. A) 1 B) 1.2 C) 1.5 D) 2
6.	B	6. Since 100 months = 8 years + 4 months, Fido, who was more than 8 years younger, was 5. A) 4 B) 5 C) 6 D) 7
7.	D	7. $\frac{2}{1} \times \frac{2}{1} + \frac{2}{1} \times \frac{2}{1} = \frac{4}{1} + \frac{4}{1} = \frac{8}{1} \times 1$. A) $\frac{8}{1}$ B) $\frac{4}{1}$ C) $\frac{2}{1}$ D) 1
8.	A	8. 100 thousandths = 5 hundredths = $0.100 - 0.050 = 0.050 = 5/100$. A) $\frac{100}{5}$ B) $\frac{100}{20}$ C) $\frac{100}{10}$ D) $\frac{1000}{95}$
9.	A	9. Write each with 5 decimal places. Only $0.20800 > 0.20080$. A) 0.20800 B) 0.20000 C) 0.02080 D) 0.20008
10.	C	10. The sum of all 3 angles is 180° , so at most one is 90° or more. A) 0 B) 1 C) 2 D) 3
11.	B	11. $\frac{22}{2} + \frac{33}{3} + \frac{44}{4} = (11+1) \times 3 = 33+3$. A) $30+3$ B) $33+3$ C) $50+5$ D) $55+5$
12.	D	12. Yogi hibernates $\frac{1}{3}$ of $\frac{5}{3}$ of every year. That is $\frac{1}{3} \times \frac{5}{3} = \frac{5}{9} = 20\%$ of every year. A) 80 B) 50 C) 40 D) 20
13.	C	13. $(3 \times 1)^2 + (3 \times 2)^2 + (3 \times 3)^2 = 3^2 \times (1^2 + 2^2 + 3^2)$. A) 5 B) 6 C) 14 D) 15
14.	D	14. I have $4 \times 85 = 340$. To get $5 \times 88 = 440$, I'll need $440 - 340 = 100$. A) 91 B) 96 C) 98 D) 100
15.	C	15. Since $333333333 = 3 \times (111111111)$, it's divisible by 111. A) 11 B) 33 C) 111 D) 3333



16.	C	16. $\frac{2 \times 3 \times 4}{21 \times 31 \times 41} = \frac{21 \times 31 \times 4 \times 3 \times 2 \times 1}{4 \times 3 \times 2 \times 1} = 21 \times 31$. A) 1 B) 41 C) 21×31 D) $2 \times 3 \times 4$
17.	D	17. Since $5n$ is always divisible by 5, $5n+1$ is never divisible by 5. A) $n+5$ B) $3n+4$ C) $4n+3$ D) $5n+1$
18.	B	18. To 2 (a prime), add 999 odd primes. Even + odd = odd. A) 0 B) 1 C) 2 D) 3
19.	C	19. The choice closest to its reciprocal is the choice closest to 1. A) 0.01 B) 0.1 C) 1.01 D) 1.1
20.	A	20. Since $1234 \div 24 = 51$ with remainder 10, 1234 hours after midnight is the same as 10 hours after midnight. That's 10 A.M. A) 10 A.M. B) noon C) 10 P.M. D) midnight
21.	C	21. A square with perimeter 24 has area $6^2 = 36$. A) 24 B) 25 C) 36 D) 144
22.	C	22. The units' digit of every power of 3 is odd. A) 1 B) 3 C) 6 D) 9
23.	B	23. $(999999 \times 999999) - (999999 \times 1) = 999999 \times (999999 - 1)$. A) 1000000×999998 B) 999999×999998 C) 999999×1 D) 999998×999998
24.	A	24. The perimeter of a rectangle = $2(\ell + w)$. When ℓ and w are integers, $2(\ell + w)$ is even. A) even B) odd C) prime D) > 4
25.	D	25. Only 30 kids sing and/or play the drums. Since $24 + 16 = 40$, 10 kids must do both. The ratio of the number who do both to the number who do neither is $10:10 = 1:1$. A) 1:4 B) 3:5 C) 4:5 D) 1:1
26.	D	26. 140 hooves \div (4 hooves per animal) = 35 animals. Since $2/5$ of the animals are bulls, the number of bulls is $(2/5) \times 35 = 14$. A) 35 B) 28 C) 21 D) 14
27.	D	27. $\frac{1}{1} = \frac{2}{2} = \frac{1}{5}$, whose reciprocal is $\frac{5}{2}$. A) $\frac{2+1}{2}$ B) $\frac{2}{2+1}$ C) $\frac{5}{2}$ D) $\frac{2}{5}$
28.	B	28. $(2\ell \times 0.02 \text{ fat}) + (3\ell \times 0.03 \text{ fat}) = (0.04 + 0.09)\ell$ fat per 5 $\ell = 2.6\%$ fat. A) 2.5% B) 2.6% C) 5% D) 6%
29.	A	29. If I start with 3, my 50th number is 150. If I start with 2, it's 149. A) 149 B) 150 C) 151 D) 152

