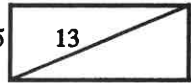

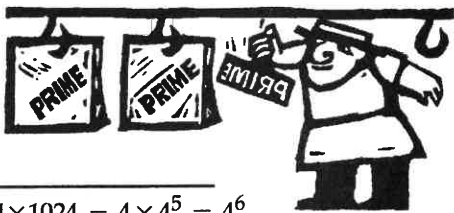



<p>29. Using the Pythagorean Theorem, $13^2 - 5^2 = 144 = 12^2$. The area is $5 \text{ cm} \times 12 \text{ cm} = 60 \text{ cm}^2$. A) 34 B) 36 C) 60 D) 65</p>		<p>29. C</p>
<p>30. If the area is $16\pi^2$, the side-length is 4π and the perimeter is 16π. A) $\frac{\pi^2}{16}$ B) $\frac{16}{\pi^2}$ C) 4 D) $16\pi^2$</p>	<p>30. D</p>	
<p>31. Since 24 is divisible by $2^3 = 8$, 24^{30} is divisible by $(2^3)^{30} = 2^{90}$. A) 18^{36} B) 24^{30} C) 30^{24} D) 36^{18}</p>	<p>31. B</p>	
<p>32. If the shortest side were 7, the sum of the other 2 sides would need to be at least 14, not the actual 11. A) 4 B) 5 C) 6 D) 7</p>		<p>32. D</p>
<p>33. The circle can cross each side of the rectangle twice, for a total of 8. A) 8 B) 7 C) 6 D) 4</p>	<p>33. A</p>	
<p>34. For the average to be 50°, the sum must be 100°, and $10^\circ + 90^\circ = 100^\circ$. A) 30° B) 40° C) 50° D) 90°</p>	<p>34. C</p>	
<p>35. If $\left(\frac{a}{b}\right)^{-c}$ equals $\left(\frac{b}{a}\right)^c$, then $\left(\frac{2}{3}\right)^{-4} = \left(\frac{3}{2}\right)^4 = \frac{81}{16}$. A) $\frac{81}{16}$ B) $\frac{16}{3}$ C) $\frac{3}{16}$ D) $\frac{2}{81}$</p>	<p>35. A</p>	
<p>36. $(\pi r^2)/(2\pi r) = (\pi r^2)/(4\pi r^2) = 1/(4\pi)$. A) $\frac{1}{4\pi}$ B) $\frac{1}{4\pi^2}$ C) $\frac{1}{2\pi}$ D) $\frac{1}{4}$</p>	<p>36. A</p>	
<p>37. Every integer from 2 to 2010 is divisible by a prime less than 2010. [NOTE: 1 is not a prime.] A) 2010 B) 2009 C) 1004 D) 1005</p>		<p>37. B</p>
<p>38. The sum of 1024 fours is $4 \times 1024 = 4 \times 4^5 = 4^6$. A) 4^4 B) 4^5 C) 4^6 D) 4^7</p>	<p>38. C</p>	
<p>39. Reduce $\frac{24}{42}$ to get $\frac{4}{7}$. Multiply $\frac{4}{7}$ by $\frac{5}{5}$ to get $\frac{20}{35}$. A) 35 B) 45 C) 55 D) 65</p>	<p>39. A</p>	
<p>40. $(151+152+153+\dots+200) = (150+1 + 150+2 + 150+3 + \dots + 150+50) = 50 \times 150 + (1+2+3+\dots+50) = 7500+1275 = 8775$. A) 6275 B) 6600 C) 8375 D) 8775</p>	<p>40. D</p>	

The end of the contest  8

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Information & Solutions

Tuesday, February 17 or 24, 2009

Contest Information

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



1. $2\sqrt{25} - 2\sqrt{16} = 2 \times 5 - 2 \times 4 = 10 - 8 = 2$.
 A) 2 B) 3 C) 4 D) 6

2. The closest we can get is $0.550 - 0.549 = 0.001$.
 A) 0.49 B) 0.509 C) 0.549 D) 0.6

3. $1 + \frac{3}{1} + 2 + \frac{3}{2} + 3 + \frac{3}{3} = 1 + 2 + 3 + \left(\frac{3}{1} + \frac{3}{2} + \frac{3}{3}\right) = 6 + \frac{3}{6} = 6 + \frac{3}{6} = 8$.
 A) 9 B) 8 C) 7 D) 6

4. The greatest factor of $39 \times 49 \times 59$ is $39 \times 49 \times 59$, an odd number.
 A) 9 B) prime C) even D) odd

5. 99 hundredths - 99 thousandths = $0.990 - 0.099 = 0.891$.
 A) 0.891 B) 0.81 C) 0.01 D) 0.001

6. Each choice has been replaced by its reciprocal.
 A) $-\frac{3}{4}$ B) $\frac{5}{6}$ C) $-\frac{7}{8}$ D) $\frac{9}{10}$

7. Since $8 \times 12 = 96$, there are 96 containers. The only multiple of 96 among the choices is $3 \times 96 = 288$.
 A) 280 B) 284 C) 288 D) 292



8. $11 \times 365 = 4015$, so 4000 days is about half a month before June 1.
 A) April B) May C) June D) July

9. Any percent of 0% is 0%.
 A) 0 B) 100 C) 100% D) 240000%

10. The length of each side is $\frac{4}{3} \div 4 = \frac{4}{3} \times \frac{1}{4} = \frac{1}{3}$, and the area is $\left(\frac{1}{3}\right)^2$.
 A) $\frac{4}{3}$ B) $\frac{3}{16}$ C) $\frac{4}{9}$ D) $\frac{256}{9}$

11. If 120% of my hourly wages is \$120, 100% of my hourly wages is \$100. That represents 8 hours of work for \$12.50 per hour.
 A) \$10 B) \$12 C) \$12.50 D) \$15



12. $250\% = 2.50 = 2.5 = 5/2$.
 A) $\frac{4}{1}$ B) $\frac{5}{2}$ C) $\frac{5}{2}$ D) 25

13. The l.c.m. of 11, 2×11 , 3×11 , and 4×11 is $3 \times 4 \times 11 = 132$.
 A) 66 B) 88 C) 99 D) 132

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15. Beginning Sunday, in 6 days I read $2 + 4 + 8 + 16 + 32 + 64 = 126$ pages. I read my 100th page on Friday.
 A) Friday B) Saturday C) Monday D) Tuesday



16. Al took 25% of my books and Ed took half the remaining $3/4$, so Ed took $3/8$ of my books. Ed's half equals my half, so $3/8$ of my books is 30, $8/8$ is 80, and 25% of 80 is 20.
 A) 15 B) 20 C) 60 D) 80

17. On a number line, -0.1 is furthest right.
 A) -0.1 B) $(-10)^3$ C) -100 D) $-\sqrt{100}$

18. $3 \times 6 \times 8 = 3 \times 6 \times 2 \times 4 = (2 \times 3 \times 6) \times 4$.
 A) 1.5 B) 2 C) 3 D) 4

19. 10:45 A.M. is 150 mins. past 8:15 A.M. & 300 mins. before 3:45 P.M.
 A) 4 A.M. B) 10:45 A.M. C) 12 P.M. D) 1:15 P.M.

20. Since $600 = 24 \times 25$, the sum of the integers is $24 + 25 = 49$.
 A) 48 B) 49 C) 50 D) 60

21. Since $\pi r^2 = 8 \times (2\pi r) = 16\pi r$, $r^2 = 16r$, and $r = 16$.
 A) 2 B) 4 C) 8 D) 16

22. $\text{Sum} = \frac{1}{1} + \frac{2}{1} + \frac{1}{2} + \frac{3}{1} + \frac{1}{3} + \frac{4}{1} + \frac{1}{4} + \frac{5}{1} + \frac{1}{5} + \frac{6}{1} + \frac{1}{6} + \frac{7}{1} + \frac{1}{7} + \frac{8}{1} + \frac{1}{8} + \frac{9}{1} + \frac{1}{9} + \frac{10}{1} + \frac{1}{10} + \frac{11}{1} + \frac{1}{11} + \frac{12}{1} + \frac{1}{12} + \frac{13}{1} + \frac{1}{13} + \frac{14}{1} + \frac{1}{14} + \frac{15}{1} + \frac{1}{15} + \frac{16}{1} + \frac{1}{16} + \frac{17}{1} + \frac{1}{17} + \frac{18}{1} + \frac{1}{18} + \frac{19}{1} + \frac{1}{19} + \frac{20}{1} + \frac{1}{20} = 1 + 1 + 1 + 1 = 4$.
 A) 4 B) 3 C) 2 D) 1

23. 20 bowls = 8 cups, and 15 mugs = 20 bowls; 8 cups = 15 mugs.
 A) 20 mugs B) 16 mugs C) 15 mugs D) 12 mugs

24. $24 = 3 \times 8$ and $124 = 31 \times 4$. The common factors are 1, 2, and 4.
 A) 1 B) 2 C) 3 D) 4

25. In dollars, the average cost of these 30 flights was $(10 \times 95 + 20 \times 86) / 30 = 2670 / 30 = 89$.
 A) \$89 B) \$90 C) \$91 D) \$92

26. $(-1)^2 - (-1)^2 = 1 - (-1) = 1 + 1 = 2$.
 A) -2 B) -1 C) 1 D) 2

27. $\sqrt{36} = 6$ is half of $12 = \sqrt{144}$.
 A) $\sqrt{18}$ B) $\sqrt{72}$ C) $\sqrt{128}$ D) $\sqrt{144}$

28. By trial, only $18 = 2 \times (1+8)$ is twice the sum of its digits.
 A) 4 B) 2 C) 1 D) 0



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