
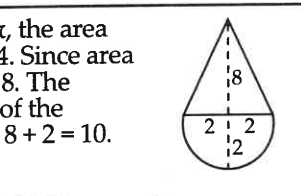






<p>26. Each beaver in a colony of 20 beavers cuts 14 logs for a dam for a total of 280. Each beaver in a colony of 40 beavers cuts 20 logs for a total of 800. The average number of logs cut is $(280 + 800) \div (20 + 40) = 18$. A) 18 B) 17 C) 16 D) 15</p>		<p>26. A</p>
<p>27. An example: If $r = 10$, then $A = 100\pi$. When $a = 25\pi$, $r = 5$, which is 50% less than $r = 10$. A) 25% B) 50% C) 60% D) 75%</p>		<p>27. B</p>
<p>28. The reciprocal of the reciprocal of $\sqrt{2}$ is $\sqrt{2}$, and $\sqrt{2} \times \sqrt{2} = 2$. A) $\sqrt{2}$ B) 2 C) $2\sqrt{2}$ D) 4</p>		<p>28. B</p>
<p>29. $3m:8a = 15m:40a$ and $5a:9p = 40a:72p$. For every 15 melons there are 72 pears, and $15m:72p = 600:2880$. A) 600 B) 1320 C) 1440 D) 2880</p>		<p>29. D</p>
<p>30. $r \diamond s$ means $r^2 - 2s$, so $3 \diamond (4 \diamond 5) = 3 \diamond (4^2 - 2 \times 5) = 3 \diamond 6 = (3^2 - 2 \times 6) = -3$. A) -9 B) -3 C) 0 D) 3</p>		<p>30. B</p>
<p>31. The original pairs (d,p) for each choice would be $(8,2)$, $(12,3)$, $(28,7)$, and $(32,8)$. After spending 2 dimes and getting 2 pennies, they'd be $(6,3)$, $(10,5)$, $(26,9)$, and $(30,10)$. So only choice D works. A) 8 B) 12 C) 28 D) 32</p>		<p>31. D</p>
<p>32. Since the area of the semicircle is $\frac{1}{2} \times 2^2 \times \pi = 2\pi$, the area of the triangle is 16. The base of the triangle is 4. Since area of a triangle is $bh/2$, we have $16 = 4h/2$, so h is 8. The greatest possible distance between two points of the figure is the length of the line segment shown, $8 + 2 = 10$. A) 10 B) 12 C) 14 D) 16</p>		<p>32. A</p>
<p>33. Pat's drawer is 100 cm wide, 200 cm long, and 50 cm deep. Its capacity is $(100 \times 200 \times 50)$ cubic cm. A) 0.01 B) 100 C) 10000 D) 1000000</p>		<p>33. D</p>
<p>34. There are 20 houses from the 12th to the 31st. The range of the house numbers is $2131 - 2011$ or 120. Adjacent house numbers differ by $120 \div 20 = 6$. Go back by 6s from the 11th to the 1st: $2011 - 6 \times 10 = 1951$. A) 1901 B) 1945 C) 1951 D) 1968</p>		<p>34. C</p>
<p>35. The integers less than 2011 with an odd number of factors are the 44 perfect squares: 1, 4, 9, ..., 1936. A) 1 B) 21 C) 32 D) 44</p>		<p>35. D</p>

The end of the contest  8

Information & Solutions

2010-2011 Annual 8th Grade Contest

Tuesday, February 15 or 22, 2011

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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 *Answer Column* to the right of each question).
- Scores** Please remember that *this is a contest, and not a test*—there is no “passing” or “failing” score. Few students score as high as 28 points (80% correct); students with half that, 14 points, *deserve commendation!*
- Answers and Rating Scales** Turn to page 147 for the letter answers to each question and the rating scale for this contest.



1.	C	A) \$0 B) \$100 C) \$1000 D) \$1111
2.	A	2. Al finds a gold nugget weighing 500 grams. Two would weigh 1000 grams = 1 kg. A) 1 kg B) 10 kg C) 1000 kg D) 10000 kg
3.	C	3. $6+(8\times 0)+(10\times 2) - (12\times 0) = 6+0+20-0 = 26$. A) 0 B) 8 C) 26 D) 38
4.	A	4. There are 19 positive integers less than 20. Of these, 4 are multiples of 4. Therefore, the desired probability is $\frac{4}{19}$. A) $\frac{19}{4}$ B) $\frac{5}{1}$ C) $\frac{19}{5}$ D) $\frac{4}{1}$
5.	D	5. The square of an integer minus the cube of that integer is never odd. A) $(-1)^2 - (-1)^3 = 2$ B) $2^2 - 2^3 = -4$ C) $2^2 - 2^3 = -4$ D) odd
6.	D	6. $127 = 1 \times 127$; 127 is prime, but 1 is not. A) $85 = 5 \times 17$ B) $94 = 2 \times 47$ C) $119 = 7 \times 17$ D) 127
7.	C	7. $(10 \times 10) \times (5 \times 20) \times (4 \times 25) \times (2 \times 50) \times 100 = 100^4 \times 100$. A) 4 B) 5 C) 100^4 D) 100^5
8.	A	8. The number of dimes in \$100 is 1000. The number of quarters in \$200 is 800. The ratio of dimes to quarters is $1000:800 = 5:4$. A) 5:4 B) 4:5 C) 5:2 D) 2:5
9.	B	9. The cost of dinner was \$60 after the 20% tip was added. Thus \$60 is 120% of the cost. Dinner without the tip was $\$60 \div 1.20 = \50 . The cost for each of us without the tip was $\$50 \div 4 = \12.50 . A) \$12 B) \$12.50 C) \$16 D) \$16.67
10.	D	10. To build a wall takes 12 hrs. for 18 workers or $12 \times 18 = 216$ hrs. for 1 worker. It would take 12 workers 216 hrs. $\div 12 = 18$ hrs. A) 6 B) 8 C) 14 D) 18
11.	B	11. 10:59 AM+1 min. is midway between 10:59 PM today and 10:59 PM+2 mins. tomorrow. A) 10 AM B) 11 AM C) 10 PM D) 11 PM
12.	C	12. $625 = 5 \times 5 \times 5 \times 5 \times 5$ has the most factors of 5. A) 125 B) 500 C) 625 D) 750
13.	D	13. $0.08 \div 0.004 = 80 \div 4 = 20 = 2000\%$. A) 5% B) 20% C) 500% D) 2000%



14.	A	14. Of every 9 balloons, 2 are fancy balloons. Since $2/9 \times 621 = 138$, Mr. B. Loon has 138 fancy balloons. A) 138 B) 183 C) 207 D) 483
15.	B	15. $\frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \times \frac{4}{3} = \frac{2}{3}$. A) $\frac{7}{4}$ B) $\frac{7}{6}$ C) $\frac{6}{7}$ D) $\frac{4}{7}$
16.	A	16. Since $2^5 \times 10^{52} = 32 \times 10^{52}$ and 10^{52} has 53 digits (a "1" followed by 52 "0s"), the product has 54 digits. A) 54 B) 55 C) 56 D) 57
17.	B	17. 1-9 has 9 digits; 10-29 has 40 additional digits. The 50th digit is a 3. A) 0 B) 3 C) 4 D) 9
18.	B	18. 32's only prime factor, 2, is a factor 5 times. A) $30 = 2 \times 3 \times 5$ B) $32 = 2^5$ C) $34 = 2 \times 17$ D) 2×3^2
19.	A	19. Each angle in an equilateral \triangle has a measure of 60° . The measures of the angles in an isosceles right \triangle are 45° , 45° , and 90° ; $60^\circ - 45^\circ = 15^\circ$. A) 15° B) 45° C) 60° D) 75°
20.	B	20. $48 = (2^2)^8 = 2^{16}$ is a multiple of $8^4 = (2^3)^4 = 2^{12}$. A) 4^4 B) 4^8 C) 8^4 D) 8^8
21.	B	21. The sum cannot be 3 since any such number is divisible by 3. A) 2 B) 3 C) 4 D) 5
22.	C	22. The number of seconds in an hour divided by the number of minutes in an hour is $(60 \times 60) \div (60) = 60$. A) 5 B) 12 C) 60 D) 1440
23.	C	23. If I'm 16, my age is doubled to 32 in 16 yrs. and tripled to 48 in 16 more. A) 8 B) 12 C) 16 D) 32
24.	D	24. If the avg. is 10, the sum is 10×10 . If one is 92 and the others is 101. A) 10 B) 50 C) 90 D) 92
25.	C	25. There are at least 3 riders on each toboggan. The sum of 21 odd primes (not necessarily all different) must be an odd number. A) 110 B) 112 C) 121 D) 122

