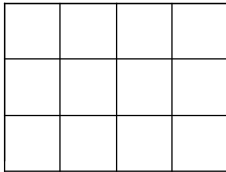


Sixth Grade Written Exam
Vestavia Hills High School Math Tournament
2012

1. Simplify: $3^2 \times (4 - 2)^2 \div 3 + 57 \times 4 \times 2$
 A. 564 B. 1 C. 565 D. 342 E. NOTA
2. If an orange costs \$40 on planet Sophie and \$3 on Earth, and a \$20 apple on planet Sophie costs \$25 on planet Siyin, how much does the orange cost on planet Siyin?
 A. \$6 B. \$12.50 C. \$50 D. \$1.50 E. NOTA
3. Simplify: $6 - 3 \times 4 + 5(3 - 9) + 2^2$.
 A. 48 B. 12 C. -24 D. -32 E. NOTA
4. If each small block is a square of equal size, how many total squares are in the figure?



- A. 12 B. 14 C. 18
 D. 20 E. NOTA

5. Use $x = 3$ and $y = -2$ to evaluate $xy - x^2(x + y) + y^2$.
 A. -1 B. 2 C. -11 D. -4 E. NOTA
6. Kelly, Claire, and Wei Ja are counting upward in multiples of different numbers. If they all start at zero and Kelly counts by 3's, Claire by 5's, and Wei Ja by 7's, what will be the first number that all three of them have said?
 A. 0 B. 15 C. 35 D. 65 E. NOTA
7. Find the solution to $2x + 9 = x(6 - 3)$.
 A. 8 B. 4 C. 5 D. 1 E. NOTA
8. Find the area of a circle with a circumference of 32π .
 A. 64π B. 256π C. 16π D. 212π E. NOTA
9. Mr. Taylor has a slightly messy desk. If the probability of him misplacing his students' work is $45/71$, and the students complete 923 assignments, how many assignments has he likely misplaced?
 A. 585 B. 333 C. 472 D. 623 E. NOTA

10. In one pond, there are 7 purple guinblobs, 5 red guinblobs, 4 green guinblobs, and 9 yellow guinblobs. Closing your eyes and choosing one and then another guinblob without replacement, what is the probability of choosing a red guinblob both times?
A. $\frac{1}{25}$ B. $\frac{4}{125}$ C. $\frac{1}{30}$ D. $\frac{1}{36}$ E. NOTA
11. Silin, the aspiring fashionista, has 12 different and sparkly shirts, 10 unique pairs of disco pants, and 6 distinct pairs of sequined shoes. How many outfits does she have if she must wear one and only one shirt, pair of pants, and pair of shoes?
A. 360 B. 720 C. 28 D. 34 E. NOTA
12. If Mike runs at 3 miles per hour, how many miles will he have run after 2 hours and 40 minutes?
A. $3\frac{2}{3}$ B. $6\frac{2}{3}$ C. 6 D. 8 E. NOTA
13. What is the multiplicative inverse of the additive inverse of 32?
A. 32 B. -32 C. $-\frac{1}{32}$ D. $\frac{1}{32}$ E. NOTA
14. Find the arithmetic mean of the mean, median, and mode of $\{1, 6, 2, 10, 7, 50, 1\}$.
A. $\frac{97}{9}$ B. $\frac{22}{3}$ C. $\frac{125}{21}$ D. $\frac{59}{9}$ E. NOTA
15. What is three-fourths of the sum of $5\frac{5}{6}$ and $7\frac{2}{5}$?
A. 527 B. $\frac{179}{7}$ C. $\frac{529}{23}$ D. $\frac{397}{40}$ E. NOTA
16. The prime factorization of 1001 can be expressed as $a \times b \times c$, where $a > b > c$. Find $a + b - c$.
A. 17 B. 9 C. 5 D. 31 E. NOTA
17. Lynn has a bag of candy containing only gummy worms and gum drops. The ratio of gummy worms to gum drops is 5:12. If there are 119 pieces of candy in the bag, how many gummy worms are there?
A. 35 B. 119 C. 84 D. 45 E. NOTA
18. A pair of Christian Louboutins was put on sale for 30% off. The original price was \$3600. Silin has \$2500. Assuming no sales tax, can she afford these shoes? If so, how much will she have left over?
A. Yes, \$20 B. Yes, \$0 C. Yes, \$33 D. No E. NOTA
19. In Andremia, each household has three humans. Each human has three cats. Each cat has three kittens. Each kitten has three birds. How many total legs are in each household?
A. 312 B. 306 C. 474 D. 364 E. NOTA

20. In how many distinct ways can the letters in GUINBLOB be arranged?
- A. 5040 B. 20160 C. 40320 D. 32208 E. NOTA
21. What is the greatest common factor of 108, 144, and 192?
- A. 12 B. 24 C. 16 D. 6 E. NOTA
22. Simplify the product: $\frac{8}{9} \times \frac{9}{10} \times \frac{10}{11} \times \frac{11}{12} \times \dots \times \frac{511}{512}$
- A. $\frac{1}{3}$ B. $\frac{1}{64}$ C. 1 D. $\frac{1}{6}$ E. NOTA
23. what is 7!?
- A. 7000 B. 120 C. 5040 D. 720 E. NOTA
24. A trapezoid has area 188 cm^2 . Find its height if the bases are of length 10 cm and 16 cm.
- A. $\frac{573}{7}$ B. $\frac{188}{13}$ C. $\frac{377}{26}$ D. $\frac{57}{4}$ E. NOTA
25. What is the units digit of 7^{43} ?
- A. 3 B. 1 C. 9 D. 7 E. NOTA

Write the answers to the tie-breakers on the back of your bubble form. Denote each answer as T1, T2, and T3.

T1. How many positive divisors does 36 have?

T2. How many centimeters are in 56 decameters?

T3. $\triangle ABC$ is similar to $\triangle DEF$. Find the length of \overline{DE} , as a decimal, if $AB = 4.5$, $BC = 6$, and $EF = 3$.

You may keep your copy of the exam.