

Sixth Grade Math Written Exam
Vestavia Hills High School Math Tournament
2014

1. If I quadruple my age and subtract 49, the result is 75. What is my age?

- A. 32 B. 128 C. 6 D. 16 E. NOTA

2. Evaluate: $1 - (2 - 3 \times 4)^3 \div 5 + 6$.

- A. 207 B. 206.2 C. 205 D. 305 E. NOTA

3. Which multiplication expression does the area model represent?

x^2	x^2	x	x
x^2	x^2	x	x
x^2	x^2	x	x
x	x	1	1

- A. $(3x+2)(3x+1)$ B. $(x+2)(2x+1)$
 C. $(2x+2)(2x+1)$ D. $(2x+2)(3x+1)$
 E. NOTA

4. Duncan has 25 milligrams of salt for his science experiment. How many grams of salt does he have?

- A. 0.25 B. 0.025 C. 2.5 D. 0.0025 E. NOTA

5. A square is inscribed in a circle. If the radius of the circle is 12 and the square has side length $12\sqrt{2}$, find the area outside the square but inside the circle. All answers are in in^2 .

- A. 144π B. $144\pi - 144$ C. $144\pi - 576$ D. $144\pi - 288$ E. NOTA

6. Convert 121120_3 to base 5.

- A. 4144 B. 3242 C. 1430 D. 447 E. NOTA

7. How many distinct arrangements are there for the letters in the word FAHRENHEIT?

- A. 907200 B. 720 C. 151200 D. 40320 E. NOTA

8. The Fantastic Four scored 89, 91, 90 and 71 on a test. What was their mean score?

- A. 89 B. no mean C. 90.5 D. 85.25 E. NOTA

9. Find the supplement of a 53-degree angle. All answers are in degrees.

- A. 37 B. 143 C. 127 D. 137 E. NOTA

10. If $a \odot b = \sqrt{ab}$ and $a \otimes b = 2a + 3b$, find $\frac{1 \odot 4}{2 \otimes 3}$.

- A. $\frac{4}{13}$ B. 1 C. $\frac{2}{13}$ D. $\frac{1}{5}$ E. NOTA

11. Simplify: $\sqrt{52-3} + \sqrt{30-5}$.

A. 13 B. 12 C. $5\sqrt{5}$ D. $2\sqrt{5}$ E. NOTA
12. A rectangular box is 8.5 inches wide, 0.5 inch high, and 1 inch long. What is the volume in in^3 ?

A. 4.5 B. 4.25 C. 4.75 D. 5.6 E. NOTA
13. In $\triangle ABC$, $m\angle B = 60$ and $m\angle C = 58$. The longest side will be opposite which angle?

A. A B. B C. C D. Not enough info E. NOTA
14. Jane walks 9 miles north and 40 miles west. What is the shortest distance to her starting point?

A. 79 mi B. 1681 mi C. 41 mi D. 1519 mi E. NOTA
15. If the area of a square is 529 u^2 , what is its perimeter? All answers are in units.

A. 23 B. 529 C. 88 D. 92 E. NOTA
16. From 11:40 p.m. to 1:20 a.m., through how many degrees does the minute hand rotate?

A. 600 B. 780 C. 420 D. 240 E. NOTA
17. Coach Kolasa's house had 1200 square feet of living space before he added a 20 ft by 15 ft rectangular room. By what percent did his living space increase?

A. 20 B. 25 C. 120 D. 125 E. NOTA
18. How many odd numbers are positive factors of 90?

A. 3 B. 5 C. 4 D. 6 E. NOTA
19. A bag contains only red marbles and blue marbles. There are 30 blue marbles in the bag. If the probability of randomly selecting a red marble is $\frac{3}{5}$, how many red marbles are in the bag?

A. 50 B. 45 C. 42 D. 36 E. NOTA
20. The total value of 750 dimes is equivalent to the value of how many quarters?

A. 300 B. 375 C. 225 D. 350 E. NOTA
21. Using the five digits 5, 6, 7, 8, and 9, each only once, form a three-digit number and a two-digit number so that their product is as large as possible. What is that product?

A. 82025 B. 83850 C. 83905 D. 83955 E. NOTA
22. If 10 workers assemble 30 stereos in 8 hours, how many stereos will 40 workers assemble in 4 hours, assuming that they all work at the same rate?

A. 32 B. 60 C. 45 D. 80 E. NOTA
23. If Yasha cuts a cake at the rate of 5 cuts per minute, how long will it take her to cut 16 pieces?

A. 3 min B. 3.2 min C. 75 min D. 80 min E. NOTA

24. Simplify: $5 + 45 \div 5 - 4$.

A. 6

B. 7.5

C. 50

D. 10

E. NOTA

25. Simplify $\frac{57}{171}$ to lowest terms.

A. $\frac{3}{5}$

B. $\frac{3}{4}$

C. $\frac{7}{8}$

D. $\frac{5}{7}$

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. A pyramid has a square base and four equilateral triangles as faces. How many edges does it have?

T2. What does "one million times one billion divided by one trillion" equal?

T3. What is the first perfect square greater than 1 to occur in the Fibonacci sequence 1, 1, 2, 3, 5, 8, ...?

You may keep your copy of the exam.