Grissom Math Tournament

20 PRE-ALGEBRA 14

Written Test

1. Sixty minutes will be allowed for completing this examination. The monitor will keep time. Students must stay in the room for the full sixty minutes.

2. No calculators, books, notes, or other aides may be used. Your monitor will supply scratch paper; you may not furnish your own. If you need more scratch paper during the test, raise your hand and the monitor will bring it to you.

3. You will receive four points for each correct answer minus one point for each incorrect answer on the twenty-five multiple choice questions. There are three tie breakers at the end of the test. Correct answers on the tie breakers are worth one-tenth of a point. Your score on the written test is the sum of these two scores.

4. If there are ties after the scores are computed as described in point 3 above, we will break them by counting number 25, then number 24, then number 23, and so on in this order as tie breakers.

5. Please give the monitor your answer sheet before you leave. You may keep the test copy. ***Be sure to bubble your student number in the appropriate place on your answer sheet. Otherwise, your paper will not be graded.***

Pre-Algebra Grissom Math Tournament January 11, 2014

1. Evaluate: $2000 + 2002 + 2004 + \ldots + 2014$.

   A. 16058 B. 16054 C. 16055 D. 16056 E. 16061

2. If $a = 3$, $b = 11$, and $c = 5$, find $(a + c)^2 + 8b$.

   A. 236 B. 152 C. 280 D. 116 E. 102

3. If a worker makes 45 boxes of labels in 2 ½ hours, then at the same rate, how many boxes of labels can be made in 50 minutes?

   A. 10 B. 15 C. 25 D. 30 E. 45

4. In how many different ways can the letters in SPACE be arranged?

   A. 5 B. 20 C. 25 D. 40 E. 120

5. What is the square root of one half of the square root of sixty-four?

   A. 1 B. 2 C. $\sqrt{2}$ D. $2\sqrt{2}$ E. 4

6. What is the average speed of Gus the tiger that traveled 189 miles from 10:52 a.m. to 11:27 a.m.?

   A. 27 mph B. 54 mph C. 108 mph D. 296 mph E. 324 mph

7. If $\frac{1}{14}$ of a class are absent and 26 are present, how many students are enrolled in the class?

   A. 27 B. 28 C. 29 D. 30 E. 31

8. Four goats eat 8 tin cans in 2 hours. How long should it take eight goats to eat 4 tin cans?

   A. 15 min. B. 20 min. C. 30 min. D. 60 min. E. 120 min.

9. If the fraction $\frac{5}{7}$ is written in decimal form, what is the 2014^{th} digit after the decimal?

   A. 2 B. 4 C. 5 D. 7 E. 8

10. In a small class for gifted math students, the grades on a test were: 65, 85, 95, 95, 80, 73, and 95. Find the sum of the range, mean, median, and mode of this set of data.

    A. 114 B. 115 C. 199 D. 294 E. 298

11. Find $x + y$ if $5(x + 4) = 15(x - 2)$ and $6(8 + y) = 12(y - 8)$.

    A. 25 B. 26 C. 27 D. 28 E. 29

12. A triangle has angles in the ratio 3:7:8. Find the measure of the largest angle.

    A. 30 B. 45 C. 64 D. 72 E. 80

13. Find k so that the line containing the points (k, 4) and (-8, 3k) is perpendicular to the line with equation $4y = 28 - x$.

A. -5 B. -4 C. -3 D. 24/11 E. 24/13

14. A jar contains a certain number of jelly beans. Jean guesses there are 125 jelly beans in the jar, Alex guesses 130, and Andrew guesses 115. Two guesses are each off by 5 and one is off by 10. How many jelly beans are actually in the jar?

A. 110 B. 120 C. 125 D. 130 E. 125

15. Given $\begin{bmatrix} 5 & 4 \\ -3 & 7 \end{bmatrix} - \begin{bmatrix} 8 & -14 \\ 6 & -5 \end{bmatrix} = \begin{bmatrix} -3 & 18 \\ d & c \end{bmatrix}$, find the value of $36\frac{c}{d}$.

A. -48 B. -27 C. 12 D. 27 E. 48

16. John scored a 92 on his history test. His math teacher told John that he could use his math team test grade to bring up his history test grade. John's new history test grade would be 75% of his original test grade plus 25% of his math team test grade. If John scores a 100 on his math team test, what will his new history test grade be?

A. 93 B. 94 C. 95 D. 96 E. 97

17. I met a guy going to the farm. He had a pig in every arm. On every pig sat two small mice. On every mouse there were 2 whiskers. How many whiskers were going with the farmer? (The farmer and the pigs had no whiskers.)

A. 4 B. 6 C. 7 D. 8 E. 16

18. If in a fish bowl of 400 fish, 4% of the fish are on the math team, how any non-math team fish must be added to reduce the percentage of math team fish to 1%?

A. 3 B. 96 C. 400 D. 1200 E. 1600

19. The length of a radius of a circle is decreased by 10%. This causes the area to be decreased by

A. 17% B. 19% C. 20% D. 21% E. 25%

20. Given $x * y = x^3 + 2xy - y^2$, find $6 * (2 * 4)$.

A. 8 B. 236 C. 216 D. 48 E. 248

21. Big Jo has a Big Cube that is 975,748 feet long on each side. A coat of paint is applied to all six faces. The cube is cut into equal cubes of 487,874 by 487, 874 by 487,874 feet. Little Jo picks one at random and tosses it like a die (singular of dice). What is the probability that the cube will land with an unpainted side up?

A. $\frac{3}{64}$ B. $\frac{1}{8}$ C. $\frac{3}{8}$ D. $\frac{1}{2}$ E. $\frac{33}{64}$

22. In the space center gift shop, 3 space rocks and 2 space ice creams cost $24.50, while 3 space ice creams and 2 space rocks cost $30.50. Find the cost of a space rock.

A. $2.50 B. $3.10 C. $5.00 D. $8.10 E. $8.50

23. Marvin the Martian can polish one wing of his space ship in one and a half hours, and his sister Marie can do the same job in one hour. Marie starts to work at 1:30 p.m. and works for 15 minutes at which time her brother joins in. If they continue to work at the given rates, at what time will they be finished polishing that wing?

A. 1:52 pm B. 1:57 pm C. 2:02 pm D. 2:12 pm E. 2:17 pm

24. If Mr. Sigurðsson walks 5ft south, then 4 ft east, then 2 ft south, then 8 ft north, and finally 3 ft east, how far is he from his starting point?

A. 5 ft B. $4\sqrt{2}$ ft C. $5\sqrt{2}$ ft D. 8 ft E. $4\sqrt{6}$ ft

25. What is the area of the parallelogram with vertices at (2, 5), (12, 5), (1, -7), and (11, -7)?

A. 60 B. 80 C. 100 D. 120 E. 140

Tie Breaker 1: What is the next term in the sequence: 4, 1, 4, 6, 9, 16, 8, 25, 36, 10, 49, 64, 12, 81, …

Tie Breaker 2: Zorp and Gorp fetch a pail of space gunk from the lake. If they divided the gunk in the ratio 7:4 and Gorp received 6 quarts less than Zorp, how many quarts of gunk did they fetch all together?

Tie Breaker 3: Find a three digit number such that:

- the hundred's and one's digits are odd
- the hundred's digit is prime,
- the ten's digit is the sum of the hundred's digit and one's digit
- the ten's digit is a perfect square.
- the three digits are different from one another