Grissom Math Tournament
Algebra I Test
January 13, 2007

1. Find the value of 2x – 3y if x = 5 and y = -2.

   A. 4 B. 9 C. 16 D. 19 E. 31

2. Which of the following integers is between $-\sqrt{24}$ and $-\sqrt{13}$?

   A. -5 B. -4 C. -3 D. -2 E. -1

3. Evaluate: $\left|-3+2+\left|7-11\right|\right|$

   A. 3 B. 4 C. 5 D. 9 E. 23

4. Find xy if x + 3y = 11 and 2x = -8.

   A. -20 B. -4 C. 1 D. 5 E. 20

5. Find the sum of the positive integral factors of 2007.

   A. 229 B. 904 C. 2911 D. 2912 E. 3036

6. Find the product of the mean and the median of the set: 13, 16, 6, 22, 14, 13.

   A. 169 B. 182 C. 189 D. 196 E. cannot be determined

7. If Pajia drives 280 miles in 3.5 hours, what is her speed in miles per minute?

   A. $\frac{1}{3}$ B. $\frac{4}{3}$ C. 8 D. 20 E. 80

8. Solve for x: 2 – 5[2 + 3(x – 7)] = 2(7 – 3x)

   A. $\frac{43}{9}$ B. $\frac{83}{9}$ C. $\frac{43}{3}$ D. $\frac{83}{3}$ E. $\frac{163}{3}$

9. Evaluate: 1 – 3 + 5 – 7 + . . . + 2005 – 2007 = ?

   A. -2008 B. -1004 C. -2 D. 0 E. 504

10. Four of the ordered pairs listed below are solutions to the same linear equation. Which of the following is not?

    A. (1, -7) B. (4, -6) C. (-5, -3) D. (-8, -10) E. (7, -5)

11. What is the unit's digit of 2007^{2007}?

A. 1 B. 3 C. 5 D. 7 E. 9

12. A line with equation $2x - 5y = 11$ intersects a line perpendicular to it at the point (3, -1). Find the coordinates of the x-intercept of the new line.

A. $\left(0, \frac{11}{5}\right)$ B. $\left(\frac{13}{5}, 0\right)$ C. $\left(0, \frac{13}{2}\right)$ D. $\left(\frac{13}{2}, 0\right)$ E. $\left(0, \frac{13}{5}\right)$

13. If each of the following are written in decimal form, how many of their decimal forms are repeating? $\frac{2}{3}, \pi, \sqrt{144}, \frac{3}{4}, \frac{5}{7}, \frac{7}{30}, \frac{567}{9}$

A. one B. two C. three D. four E. five

14. Mickey is 5 less than twice as old as Goofy, and Donald is one more than twice as old as Goofy. One year from now, Donald will be $\frac{6}{5}$ as old as Mickey. How old is Mickey now?

A. 17 B. 18 C. 28 D. 29 E. 35

15. How many integers are solutions to the inequality: $7 > |2x - 3|$?

A. 6 B. 7 C. 14 D. 15 E. infinitely many

16. Three of the Backyardigans are on an adventure. They are trying to build a tree out of clay. Uniqua could build the tree by herself in 9 hours. Pablo and Tyrone could build the tree together in 6 hours. How long will it take if they all three work together (rounded to the nearest hour)?

A. 7 hours B. 4 hours C. 3 hours D. 2 hours E. 1 hour

17. James and John are competing in the daily four-wheeler version of a monster truck competition. The race is five full laps around the yard. James starts off 2 minutes before John, but his four-wheeler goes 5 feet/min slower than John's. If John has ridden for 8 minutes when he catches James, how far have they each traveled?

A. 120 feet B. 140 feet C. 160 feet D. 180 feet E. 200 feet.

18. Given that $xy = 13$, and $x + y = 10$, find the value of $x^2 + y^2$.

A. 74 B. 84 C. 87 D. 100 E. none of these

19. If a circle has a diameter with endpoints at (2, -7) and (-4, 9), find the area of the circle.

A. 45π B. 73π C. 121π D. 146π E. 292π

20. Which of the following is closest to the value of: $3\sqrt{20}+2\sqrt{18}-\sqrt{125}-\sqrt{32}$

A. 3 B. 4 C. 5 D. 6 E. 7

21. If f(x) = $4x^2 - 28x + 49$ and g(x) = $\sqrt{x}+5$, find g(f(11)).

A. 0 B. 6 C. 12 D. 16 E. 20

22. Find the sum of the solutions to the equation: $\frac{2x+1}{x-5}+\frac{3x+5}{x}=\frac{-2x-1}{x(x-5)}$.

A. $-\frac{9}{5}$ B. $-\frac{7}{5}$ C. $\frac{7}{5}$ D. $\frac{9}{5}$ E. $\frac{23}{5}$

23. Daisy and Minnie are going to the ice cream store for sundaes. A regular sundae has one scoop of ice cream, one kind of hot topping, and one type of sprinkle topping. There are three flavors of ice cream to choose from, two types of hot toppings, and three types of sprinkle toppings. If each of the ladies orders a regular sundae (without talking to the other), what is the probability they choose the same combination?

A. $\frac{1}{324}$ B. $\frac{1}{72}$ C. $\frac{1}{36}$ D. $\frac{1}{18}$ E. $\frac{1}{9}$

24. Find the sum of the squares of the solutions to the equation: $\sqrt{2x+11}=12-x$.

A. 49 B. 50 C. 361 D. 401 E. 410

25. There are 400 students at NCLB High School where students have three choices for foreign languages. If 180 take Chinese, 160 take Spanish, and 160 take Latin, 60 take both Spanish and Latin, 60 take both Chinese and Spanish, 70 take Latin and Chinese, and 50 take no language, how many students take all three languages?

A. 0 B. 10 C. 20 D. 30 E. 40

TB1. Find the remainder when 2007 is divided by 123.

TB2. Find the sum of the first 12 odd integers.

TB3. Given four distinct, collinear points, A, B, C, and D. If AB=BC=CD, and the coordinates of A and C are (2, 5) and (32, 49) respectively, find the sum of the coordinates of point D.