Grissom Math Tournament
Pre-Algebra Test
January 13, 2007

1. Simplify $|18| - |-3|$..

A. -21 B. -15 C. 15 D. 21 E. 24

2. Simplify $6 + 24 \div (4 + 2) + 3 \times 5$

A. $\frac{2}{3}$ B. 20 C. 25 D. 40 E. 65

3. An airplane descended 250 feet in 5 minutes. What is the average rate of descent in feet per minute.

A. 50 B. 100 C. 250 D. 1250 E. None of these

4. Einstein's new DVD player spins at a rate of 900 revolutions per minute. How many revolutions does it make in 20 seconds?

A. 45 B. 300 C. 1800 D. 2700 E. 18000

5. If $a = 5$ and $b = 20$, what is the value of $2a + b$?

A. 25 B. 30 C. 40 D. 45 E. 50

6. Given the set: {15, 18, 30}, find the GCF (greatest common factor) plus the LCM (least common multiple).

A. 36 B. 87 C. 93 D. 96 E. 123

7. What is the rate (in miles per hour) of a motorist who traveled 21 miles from 11:43 a.m. to 12:18 p.m.?

A. $\frac{12}{25}$ B. $\frac{3}{5}$ C. 21 D. 35 E. 36

8. A number increased by 13 is at least -39. Which of these could not be the number?

A. -60 B. -50 C. -40 D. -30 E. -20

9. 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 two lice. How many lice were going with the farmer? (The farmer and the pigs had no lice.)

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

10. At Dollar Discounts, 3 folders and 2 notebooks cost \$2.45 while 3 notebooks and 2 folders cost \$3.05. Find the cost of a folder.

A. \$0.25 B. \$0.31 C. \$0.50 D. \$0.81 E. \$0.85

11. One of two supplementary angles is four times twice the other. What is the measure of the larger angle, in degrees?

A. 20 B. 36 C. 40 D. 80 E. 160

12. If in a fish bowl of 300 fish, 3% of the fish are on the math team, how many non math team fish must be added to reduce the percentage of math team fish to 1%?

A. 2 B. 97 C. 300 D. 600 E. 900

13. What is the sum of all the numbers between 1 and 100 that are evenly divisible by 6?

A. 810 B. 816 C. 818 D. 824 E. 828

14. Simplify: $\sqrt{\left(4^2 \div 42^2 \times 28^2 \div 256\right) + \frac{5}{4}}$

A. 1 B. 1.25 C. 1.5 D. 2.25 E. 2.5

15. If a bowl contains 8 red marbles, 2 blue marbles and 6 pink marbles, what is the probability of picking a blue or pink marble?

A. $\frac{1}{8}$ B. $\frac{3}{16}$ C. $\frac{1}{4}$ D. $\frac{7}{16}$ E. $\frac{1}{2}$

16. If $\frac{a}{b} = 12$ and $\frac{b}{c} = 20$, what is the value of $\frac{b+c}{a}$?

A. $\frac{7}{80}$ B. $\frac{11}{20}$ C. $\frac{3}{5}$ D. 240 E. 2880

17. If the fraction $\frac{5}{7}$ is written in decimal form, what is the 2007th digit after the decimal?

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

18. Given $x * y = x^2 + xy - y^3$, find $5 * 6 * 2$

A. -283 B. -103 C. 7 D. 70 E. None of these

19. Grissom High School offers math team 3 periods in the day: 2nd, 3rd and 6th. 10 students are in 2nd period, 7 students are in 3rd period and 5 students are in 6th period. Two students registered for all three periods, 3 registered for 2nd and 3rd period, 3 registered for 3rd and 6th period and 4 registered for both 2nd and 6th period. If each math team student registered for at least one period of math team class, how many students are on the math team?

A. 14 B. 15 C. 17 D. 25 E. 27

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

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

21. The ratio of two numbers is 7 to 8. Find the larger number if their sum is -165.

A. -105 B. -90 C. -88 D. -77 E. -60

22. How many digital clock times with the colon removed when separated by one or two multiplication signs yield a product of 75? (for example: 2:53 works because 25 x 3 = 75)

A. 2 B. 4 C. 6 D. 8 E. 10

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

A. 14 B. 16 C. 18 D. 100 E. 121

24. Given the proportion *a:b:c* = 3:1:5, find the value of $\frac{2a+3b}{4b+3c}$.

A. $\frac{6}{19}$ B. $\frac{9}{19}$ C. $\frac{2}{3}$ D. 1 E. $\frac{21}{19}$

25. Zack and Cody have a business mowing lawns. Zack can mow 1 more lawn per hour than Cody can. They mow 32 lawns in 4 hours. For every 16 lawns he mows, Cody needs 9 gallons of fuel. After both Zack and Cody mow for 24 hours straight, they find they have used the same amount of fuel. How many gallons per lawn of fuel does Zack use?

A. $\frac{7}{16}$ B. $\frac{1}{2}$ C. $\frac{9}{16}$ D. $\frac{5}{8}$ E. $\frac{11}{16}$

TB1. Find a three digit odd number with distinct digits such that the first and last digits are perfect squares and the second digit is the sum of the other two.

TB2. Let w = number of minutes in a leap year, x = number of cups in a gallon, y = number of pints in two quarts, and z = number of inches in a mile. Find $\frac{z}{240}+5x+3y$

TB3. A triangle has a perimeter of 165 cm. The length of side a is 65 cm less than twice the length of side b. The length of side c is 10 cm less than the length of side b. Find the difference between the longest and shortest side.