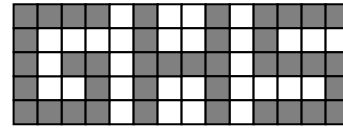


GRISSOM MATH TOURNAMENT
APRIL 17, 2010
PREALGEBRA TEST

1. Find the area of the shaded region of the figure made of squares with side length 1.



- A. 30 B. 40 C. 50 D. 55 E. 70
2. Evaluate: $(39+2)(83-4)$.
- A. 3227 B. 3229 C. 3230 D. 3237 E. 3239
3. What is ten less than twelve less nine cubed?
- A. -731 B. -727 C. 707 D. 727 E. 737
4. Evaluate: $5^2 - 3 \left(-2 \left(-7 \right) - 11 \right)$
- A. 24 B. 13 C. 11 D. 2 E. -13
5. Find the median of the set: 3, 6, 8, 7, 4, 7, 3, 9, 1, 10.
- A. 4 B. 5 C. 6 D. 6.5 E. 7
6. Laura has 4 shirts, 6 pairs of pants, and 3 pairs of shoes. If an outfit must consist of one shirt, one pair of pants and one pair of shoes, how many outfits can she make?
- A. 3 B. 12 C. 13 D. 24 E. 72
7. James goes to school at 7:45 and goes to class. He goes to recess for ten minutes, and lunch from 11:55 until 12:15. He goes to P.E. from 8:55 until 9:30, and on Fridays, he goes to art or music from 1:30 until 2:10. He leaves school at 2:25. If the rest of the day is spent in his seat in class, how many hours and minutes does James spend in his seat on Fridays?
- A. 3:55 B. 4:25 C. 4:55 D. 5:05 E. 5:15
8. Solve the following for c: $12c - 7 = 41$.
- A. $\frac{17}{6}$ B. 3 C. $\frac{23}{6}$ D. 4 E. none of these
9. If John travels 10 miles at 5 miles per hour, 12 miles at 4 miles per hour, and 18 miles in three hours, what was his average speed for the trip?
- A. 4 B. $\frac{24}{5}$ C. 5 D. $\frac{40}{11}$ E. $\frac{50}{11}$

10. Two students are writing math team questions. If Patrick writes 10 questions every 30 minutes and Dave writes 5 questions every 20 minutes, how many hours will it take them to write 100 questions?

A. $\frac{20}{7}$ B. $\frac{30}{7}$ C. 3 D. 2 E. $\frac{19}{7}$

11. Find the slope of the line through the points (1, 7) and (3, 19).

A. $\frac{1}{6}$ B. $\frac{1}{4}$ C. 3 D. 4 E. 6

12. If a tree frog jumps up 5 inches on each jump and slides back 3 inches between jumps. If he is dropped to the bottom of a 5 foot tube, how many jumps will it take for him to escape?

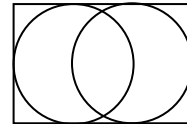
A. 28 B. 29 C. 30 D. 31 E. 32

13. One day Jerry found a bag of nickels. The number of nickels in the bag is equal to the least common multiple of 35 and 20. If Jerry decides to spend the money on gumballs costing 18¢ each, how many gumballs will he be able to purchase?

A. 7 B. 8 C. 37 D. 38 E. 39

14. If each circle passes through the center of the other circle, and each circle has a circumference of 18π , what is the perimeter of the rectangle?

A. 45 B. 60 C. 90
D. 243 E. 486



15. Solve for x: $7x + 4(2 + 3x) = 3(6x + 7) - 2$.

A. 9 B. 10 C. 11 D. 12 E. 13

16. If there are 9 flat multi-colored marbles, 6 green marbles, 4 blue marbles, 3 fancy marbles, and 2 orange marbles, find the probability you choose a blue or an orange marble if one marble is chosen at random.

A. $\frac{8}{23}$ B. $\frac{6}{23}$ C. $\frac{1}{4}$ D. $\frac{1}{3}$ E. $\frac{8}{25}$

17. Gerry bought a bag of chimichangas for Penny. The sales tax rate on the order was 7.5%. If Gerry could have bought nine chimichangas (including the tax) with the money he had to pay in tax on his original order, how many chimichangas were in his original order?

A. 121 B. 123 C. 125 D. 127 E. 129

18. What is the sum of the positive integer factors of 48?

A. 11 B. 75 C. 76 D. 124 E. 128

19. Simplify completely: $\frac{3\sqrt{150} - 3\sqrt{24} + 2\sqrt{54}}{\sqrt{90}}$.

A. $\frac{\sqrt{15}}{6}$

B. $\frac{\sqrt{15}}{3}$

C. $\frac{\sqrt{30}}{10}$

D. $\sqrt{15}$

E. $\frac{\sqrt{6}}{3}$

20. Rushil drives 3 miles east, 5 miles north, 6 miles east, and 7 miles north, what is the straight line distance from his starting point to his new position?

A. 9

B. 12

C. 15

D. 18

E. 21

21. Hyun Su spends one fifth of the money in her wallet to buy ice cream. She then spends one fourth of what remains in her wallet to buy candy. If she spent \$60 altogether, how much money did she have when she started?

A. \$75

B. \$100

C. \$120

D. \$150

E. \$180

22. If two fair, six-sided dice are rolled, find the probability the sum of the faces showing is an odd prime number.

A. $\frac{4}{11}$

B. $\frac{7}{11}$

C. $\frac{2}{9}$

D. $\frac{7}{18}$

E. $\frac{1}{2}$

23. If two of the edges of a rectangular box have lengths 3 and 4 and the diagonals of two of the faces have lengths $3\sqrt{5}$ and $2\sqrt{13}$, find the volume of the box.

A. $60\sqrt{3}$

B. 72

C. $72\sqrt{3}$

D. 84

E. $84\sqrt{3}$

24. If a, b, and c are positive integers and $a \clubsuit b \diamond c = \frac{b+c}{a} - \frac{a+c}{b} - \frac{a+b}{c}$, then find $2 \clubsuit 4 \diamond 6$.

A. 2

B. 3

C. 4

D. 6

E. 8

25. What is the sum of all numbers formed by the following rules?

- the number has three digits or less
- the number is formed only with the digits 8, 6, and 5
- no digits appear more than once in each number

A. 4,218

B. 4,219

C. 4,236

D. 4,655

E. 4,673

TB1: Find the sum of the first nine perfect squares.

TB2: How many prime numbers less than 200 have unit's digit equal to 3?

TB3: A $4 \times 4 \times 1$ layer of unit cubes is placed with the 4×4 side on a table, then a $3 \times 3 \times 1$ layer is placed on top of the center of the previous layer. Next, a $2 \times 2 \times 1$ layer and a $1 \times 1 \times 1$ layer are placed similarly. Find the total surface area of the figure.