5TH GRADE

RANDOLPH SCHOOL MATHEMATICS TOURNAMENT APRIL 30, 2011

There are 30 multiple-choice questions and three tiebreakers on this test. Mark your answers on the scantron sheet. **If none of the answers is correct, choose E**. No aids such as calculators, notes, books, etc., may be used in completing the test. You may write on the test and use the scratch paper attached to the back of this test.

Cell phones are not allowed in the room. If it is determined that you are in possession of one during the testing, you will be disqualified.

Your score on this examination will be computed as **FOUR TIMES THE NUMBER CORRECT MINUS THE NUMBER INCORRECT**. Blanks are not counted as correct or incorrect in computing the score.

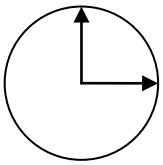
The tiebreakers count one-tenth of one point. It is recommended that you work on the tiebreakers only after you have completed all the multiple-choice questions. Write the answers to the tiebreakers in the designated spaces on the scantron sheet.

The time limit on the test is one hour. If you finish before time is called, you may leave the room, but you must also leave the testing area.

5th Grade Test

Randolph School Mathematics Tournament

April 30, 2011



1. In the poorly designed clock to the right, the hour hand and minute hand are both as long as the radius of the circular clock face, which is 6 inches. What is the smaller area of the clock face that is cut off by the hour and minute hands at 3:00?

A. 36π in^2 B. 18π in^2 C. 9π in^2 D. 6π in^2

2. Solve for x. $3x-17=22$

A. 13 B. $\frac{5}{3}$ C. 117 D. 15

3. The ratio of x to y is 4:7. Find the value of x if y = 28.

A. 49 B. 28 C. 22 D. 16

4. One-third of the pirates in Captain Hook's band have wooden peg legs. All together, the pirates have 55 feet. How many pirates have been fortunate enough not to lose either foot?

A. 5 B. 11 C. 22 D. 44

5. One of the angles in a triangle has a measure of $78°$. One of the remaining two angles is twice as big as the other. What is the measure of the smallest angle in the triangle?

A. $24°$ B. $34°$ C. $44°$ D. $52°$

6. What is the sum of the prime numbers between 35 and 60?

A. 227 B. 280 C. 331 D. 337

7. The symbols $+,-,\times,\div$ can be placed once each in the four blanks below to make a true equation. Which of the following orders (from left to right) will make a true equation?

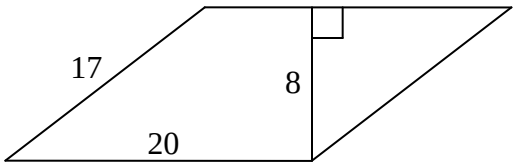
$$5\_\_\_4\_\_\_3\_\_\_2\_\_\_1=3$$

A. $+,\div,\times,-$ B. $-,+,\div,\times$ C. $-,+,\times,\div$ D. $+,-,\times,\div$

8. Evaluate. $\frac{2}{5}+\frac{5}{3}-\frac{4}{7}$

A. $\frac{11}{15}$ B. 3 C. $\frac{1}{105}$ D. $\frac{11}{105}$

9. What is the area of the parallelogram shown to the right?



A. 160 B. 136 C. 170 D. 80

10. Five jelly beans, all of different colors, are to be arranged in a row on a table. In how many different ways can this be done?

A. 24 B. 120 C. 32 D. 720

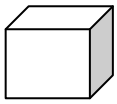
11. When planning a one-day trip that was supposed to take place on July 11, Alex accidentally reversed the numbers of the month and the day. As a result, he thought the trip was supposed to take place on a Monday in November. On what day of the week was the actual trip supposed to take place?

A. Monday B. Tuesday C. Wednesday D. Thursday

12. A speed of 45 miles per hour is the same as how many feet per second?

A. 3960 B. 45 C. 66 D. 31

13. In a room shaped like a rectangular prism, Julia connected each pair of corners with a separate piece of yarn. How many pieces of yarn did she use?



A. 8 B. 20 C. 28 D. 56

14. Boris biked a "century" (a distance of 100 miles) at a speed of 16 miles per hour. If he started at 8:30 a.m., what time was it when he finished?

A. 4:45 p.m. B. 2:45 p.m. C. 2:30 p.m. D. 12:30 p.m.

15. What is the sum of the next two numbers in the following pattern? 3, 6, 12, 24, 48, …

A. 96 B. 144 C. 192 D. 288

16. Which of the following is equivalent to $120\% \times 40\% \times 150\%$?

A. 0.72 B. 0.72% C. 720% D. 72

17. The average of 3 positive integers is 22. The median of the numbers is 20. What is the largest possible value of the largest of the three numbers?

A. 45 B. 66 C. 27 D. 26

18. Solve for *x*. $\sqrt{x+1}+12=37$

A. 5 B. 196 C. 624 D. 625

19. The ratio of the diameters of two concentric circles is 2:3. What fraction of the area of the larger circle is outside the smaller circle?

A. $\frac{1}{3}$ B. $\frac{2}{3}$ C. $\frac{4}{9}$ D. $\frac{5}{9}$

20. Evaluate. $-(3-(-2-(-8)))-(-6)$

A. -7 B. -19 C. 9 D. 19

21. If $3x-4y=19$ and $2x-5y=29$, find $|x+y|$.

A. 48 B. 4 C. 10 D. -4

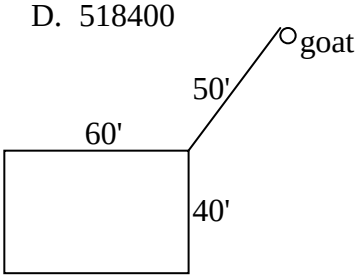
22. Suppose that $a \downarrow b = a^b - b^a$. Find $2 \downarrow 3$.

A. -6 B. 17 C. -1 D. 0

23. Find the product of the squares of the first six non-negative integers

A. 120 B. 720 C. 14,400 D. 518400

24. A goat is tied by a 50-foot rope to the outside corner of a rectangular shed with dimensions $40' \times 60'$. What is the total area, in square feet, of the field outside the shed that the goat can graze on?



A. 2500π B. 1900π C. 1875π D. 1250π

25. What is the measure of the smaller angle formed by the hour and minute hands of a standard 12-hour clock at 2:30?

A. 105° B. 120° C. 135° D. 150°

26. Evaluate. $\sqrt{169} - \sqrt{144}$

A. $\sqrt{25}$ B. $\sqrt{13}$ C. $\sqrt{12}$ D. $\sqrt{1}$

27. In order to have enough grass to provide for all its cows, a farm must have 5 acres for every 2 cows. How many cows can a 235-acre farm support?

A. 47 B. 94 C. 235 D. 587

28. What is the number of integer factors of 24?

A. 2 B. 6 C. 8 D. 16

29. A woodchuck can chuck wood at a rate of 84 pieces per minute. How much wood could a woodchuck chuck if a woodchuck could chuck wood for only 215 seconds?

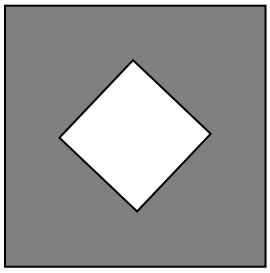
A. 301 pieces B. 180 pieces C. 215 pieces D. 18,060 pieces

30. Valerie has a total of 42 nickels and quarters. If the value of Valerie's quarters is the same as the value of her nickels, what is the difference between the numbers of her quarters and her nickels?

A. 30 B. 28 C. 26 D. 24

Tie Breakers

1. If two standard six-sided dice are rolled, what is the probability that the top two numbers will add up to a prime or a composite number?



2. The diagram to the right shows a smaller square inside a larger square. If the ratio of the side lengths of the two squares is 1:3, and the perimeter of the smaller square is 8, find the area of the shaded region.

3. Evaluate. Write your answer as a decimal. $\frac{12!}{8!6!}$