6th Grade

Hoover High School
Mathematics Tournament

March 2, 2013

DIRECTIONS:

1. Do not open this test until you are told to do so.

2. 60 minutes will be allowed for completing this examination. The monitor will keep time. Students must stay in the room for the full 60 minutes.

3. Use a #2 lead pencil.

4. NO calculators, books, notes, or other aides may be used. Scratch paper will be provided; you may not furnish your own. If you need more scratch paper during the test, raise your hand and your monitor will bring it to you. You may write on your test.

5. N. O. T. A. stands for "None of these Answers."

6. You will receive four points for each correct answer minus one point for each incorrect answer on the 25 multiple choice questions. There are three tiebreakers at the end of the test and these will be graded on the basis of 0.1 point for each correct answer. Your score on the written test is the sum of these two scores.

7. Your answers to the tiebreakers should be recorded on your tiebreaker answer sheet.

8. Please give the monitor your answer sheet and your tiebreaker answer sheet before you leave the testing room.

2013 Hoover High School Mathematics Tournament
6th Grade Written Test

1. What is the positive difference between $7\frac{3}{7}$ and $3\frac{5}{8}$? Answer as a mixed number.

A) $4\frac{8}{15}$ B) $3\frac{45}{56}$ C) $3\frac{11}{56}$ D) $3\frac{1}{7}$ E) NOTA

2. The ratio of boys to girls in a class is 7:8. If the class has 60 students, how many are girls?
A) 28 B) 30 C) 32 D) 36 E) NOTA

3. Write 0.83% as a decimal.
A) 83 B) 8.3 C) 0.083 D) 0.0083 E) NOTA

4) On a test with 32 questions, Danae correctly answered 20 and left 2 blank. What % of questions did she answer incorrectly?
A) 37.5% B) 31.25% C) 6.25% D) 62.5% E) NOTA

5. If $4218 \div 13 = a + \frac{b}{c}$ where a, b, c are all positive integers and $b < c$, what is $a + b + c$?
A) 4546 B) 339 C) 343 D) 28 E) NOTA

6. If $X \# Y = \frac{2X + Y}{2}$ evaluate $(4 \# 6) \# 2$.
A) 8 B) 13 C) 14 D) 25 E) NOTA

7. What is 150% of K if K is 50% of 300?
A) 150 B) 225 C) 600 D) 300 E) NOTA

8. Evaluate $\left\| -8 \div 2 + 3 \right| - \left| 2 + 5 \div 10 \right\|$?

A) $\frac{9}{10}$ B) $\frac{3}{2}$ C) $\frac{7}{2}$ D) $\frac{8}{3}$ E) NOTA

9. A blue airplane leaves from an airport at 11 a.m. and flies east at 300mph. An orange airplane leaves from the same airport on the same day at 1 p.m. and flies east at 250mph. How far apart are the airplanes at 3 p.m. on the same day?
A) 1700 miles B) 700 miles C) 400miles D) 1300 miles E) NOTA

10. Evaluate $\frac{y}{5x} - z$ for $x = 6, y = 120, z = 3$
A) 1 B) 4 C) 27 D) 7 E) NOTA

11. In which data set is the mean different than the median?
A) 5,3,6,8,4,7 B) 5,4,3,5,4,3 C) 6,3,5,4,4,4 D) 7,9,8,10,11,9 E) NOTA

12. Janice, the babysitter, earns \$5 per hour per child. During one year, Janice babysits Ann and Alan every Saturday for 4 hours and Bill, Betty, and Bob every other Saturday for 2 hours. How much money did Janice make in one year babysitting?

A) \$1375 B) \$2860 C) \$1430 D) \$2750 E) NOTA

13. MCMLXIII is the Roman numeral form of what number?

A) 1948 B) 2163 C) 1963 D) 2013 E) NOTA

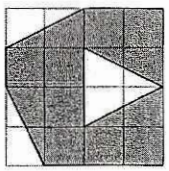
14. Each letter in the words "one can always reason with reason" is written on a separate piece of paper and placed in a sack. What is the probability of blindly drawing a vowel? (y is not a vowel.)

A) $\frac{3}{14}$ B) $\frac{3}{7}$ C) $\frac{2}{7}$ D) $\frac{3}{4}$ E) NOTA

15. A positive integer is called "perfect" if it equals the sum of its factors that are less than the integer itself. Which of these is NOT "perfect"?

A) 6 B) 496 C) 312 D) 28 E) NOTA

16. This figure shows 1 square inch. The area of each small square equals $\frac{1}{16}$ of a square inch. Write a fraction for the shaded area of the drawing.



A) $\frac{11}{16}$ B) $\frac{3}{4}$ C) $\frac{13}{16}$ D) $\frac{5}{8}$ E) NOTA

17. The moon is 238,900 miles from the earth. If you travelled from the earth to the moon and back, what would be your exact mileage in scientific notation in miles?

A) 4.778×10^{-5} B) 4.8×10^{5} C) 4.778×10^{5} D) 4.8×10^{-5} E) NOTA

18. Andrew wanted to make a round pizza 12 inches in diameter with a crust ring on the outside that was 25% of the whole pizza. How wide would the crust need to be in inches?

A) $6-3\sqrt{3}$ B) 3 C) 1.5 D) $6-2\sqrt{6}$ E) NOTA

19. The operator ! is defined as $n!=n(n-1)(n-2)...(2)(1)$. For example $3!=3\times2\times1=6$.

If $\frac{15!}{13!}=A$ and $5!3!=B$ find $\frac{A}{B}$.

A) $\frac{1}{13}$ B) $\frac{225}{13}$ C) 151200 D) $\frac{7}{24}$ E) NOTA

20. What is the sum of the least common multiple and greatest common factor of 12 and 16?

A) 50 B) 36 C) 54 D) 53 E) NOTA

21. Write $1+\cfrac{1}{1+\cfrac{1}{1+\frac{1}{5}}}$ as an improper fraction.

A) $\frac{17}{11}$ B) $\frac{16}{5}$ C) $\frac{21}{11}$ D) 5 E) NOTA

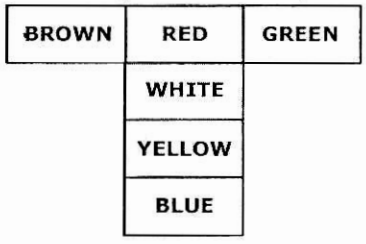
22. It is 2:00 a.m. on March 1, 2013. How much money would you make in the next 36 hours if you made \$9 every time the hands of a clock formed a 90 degree angle? This clock only has an hour hand and a minute hand.

A) \$594 B) \$648 C) \$1296 D) \$54 E) NOTA

23. Paul wants to store some DVD's in a rectangular box that is 15 inches tall and that has a base measuring 2 feet by 3 feet 7 inches. If each DVD package measures $5\frac{3}{8}$ inches by $7\frac{1}{2}$ inches by $\frac{1}{2}$ inch, what is the maximum number of DVD packages that will fit in the storage box?

A) 384 B) 1152 C) 48 D) 768 E) NOTA

24. A ladybug landed on one of the six squares of the T-shaped color configuration shown below and then randomly moved to an adjacent square. What is the probability that the ladybug ended up on the red square?



A) $\frac{5}{12}$ B) $\frac{1}{6}$ C) $\frac{1}{2}$ D) $\frac{1}{12}$ E) NOTA

25. In Mrs. Puff's Boating School, advanced students must take at least one of three classes: Protecting the Class Egg (PCE), Offensive Driving Skills (ODS), Hall Monitor Training (HMT.) There are 100 advanced students. Of these students, 60 take PCE, 42 take ODS and 25 take HMT. In addition 18 take PCE and ODS, 13 take PCE and HMT, and 10 take ODS and HMT. Determine the number of student that take all three classes.

A) 16 B) 19 C) 14 D) 29 E) NOTA

Tiebreakers

TB1. What is the circumference of a circle given that its Area $= 9\pi$.

TB2. Five fair coins are tossed up at the same time. What is the probability that all of the coins land heads up?

TB3. The area of a right triangle is 10 square units. If one leg's length is 3, find the length of the hypotenuse.