Name: _____ Score: _____/_____/**50** Grade: _____

The accuracy round is 40 minutes long. Each question is 5 points. The entire test is 50 points.

1. _____

2. _____ votes

3. _____

4. _____ ways

5. _____

6. _____ inches

7. _____ numbers

8. _____

9. _____ ways

10. _____ pieces

Special Thanks to:

1. Len's Spanish class has four tests in the first term. Len scores 72, 81, and 78 on the first three tests. If Len wants to have an 80 average for the term, what is the minimum score he needs on the last test?

2. In 1824, the Electoral College had 261 members. Andrew Jackson won 99 Electoral College votes and John Quincy Adams won 84 votes. A plurality occurs when no candidate has more than 50% of the votes. Should a plurality occur, the vote goes to the House of Representatives to break the tie. How many more votes would Jackson have needed so that a plurality would not have occurred?

3. $1/2 + 1/6 + 1/12 + 1/20 + 1/30 = 1 - 1/n$. Find n.

4. How many ways are there to sit Samuel, Esun, Johnny, and Prat in a row of 4 chairs if Prat and Johnny refuse to sit on an end?

5. Find an ordered quadruple (w, x, y, z) that satisfies the following:

$$3^w + 3^x + 3^y = 3^z$$

where $w + x + y + z = 2017$.

6. In rectangle $ABCD$, E is the midpoint of CD. If $AB = 6$ inches and $AE = 6$ inches, what is the length of AC?

7. Call an integer interesting if the integer is divisible by the sum of its digits. For example, 27 is divisible by $2 + 7 = 9$, so 27 is interesting. How many 2-digit interesting integers are there?

8. Let $a\#b = \frac{a^3 - b^3}{a - b}$. If a, b, c are the roots of the polynomial $x^3 + 2x^2 + 3x + 4$, what is the value of $a\#b + b\#c + c\#a$?

9. Akshay and Gowri are examining a strange chessboard. Suppose 3 distinct rooks are placed into the following chessboard. Find the number of ways that one can place these rooks so that they don't attack each other. Note that two rooks are considered attacking each other if they are in the same row or the same column.
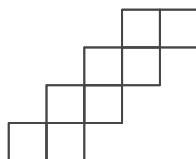
10. The Earth is a very large sphere. Richard and Allen have a large spherical model of Earth, and they would like to (for some strange reason) cut the sphere up with planar cuts. If each cut intersects the sphere, and Allen holds the sphere together so it does not fall apart after each cut, what is the maximum number of pieces the sphere can be cut into after 6 cuts?