WSMA Math Bowl - March 29, 2014

College Bowl Round 2 Proctors' Answer Sheet

1	Assuming there really are 49 flavors in a jar of jelly beans, how many jelly beans does Steven need to eat in order to guarantee that at least 3 of the same bean are eaten?	99
2	Derek is out to lunch. Because it is his birthday, he gets 20% off his bill before tax and tip. The 18% tip and 9% tax are calculated after this discount. What percent of his original bill does Derek ultimately pay? Round your answer to the nearest percent.	102
3	There are 8 couples at a party. Each person wants to meet everyone else, so they all shake hands. If everyone shakes everyone else's hand exactly once, but not the hand of their partner, how many handshakes occur?	112
4	Arthi has many different keys. What is the largest number of keys she can have on a ring such that she can get from any ordering of keys to another by rotating or reflecting?	3
5	The ratio of the width to the length of rectangle S is 1:2. If the width is increased by 10 and the length by 5, the area increases by 50%. Find the product of all possible values of the original length.	200
6	Find the maximum volume of the rectangular prism that is inscribed in a sphere with a radius of 6.	$192\sqrt{3}$
7	Steven and Andrew are writing Math Bowl problems. Steven writes at a rate of 11 problems a day, while Andrew writes at a rate of 7 problems a day. What fraction of time will they finish in if they both work constantly, as opposed to if each simultaneously writes half the problems?	7/9
Extra	If x=1-1/x, find the value of x^3	1