Math Bowl Practice Game **Source: 2010 CSU Math Bowl Questions** **Theme: Probability / Counting**

1	A student randomly guesses on all 100 questions of a multiple choice exam with 4 possible answers per problem. What is his expected score? **ANSWER**: 25.
2	Evaluate $\frac{6!}{3!4!}$. **ANSWER**: 5.
3	How many ways are there to move from the intersection of two streets in a big city to an intersection 4 blocks east and 2 blocks north assuming the streets of the city form a grid? **ANSWER**: 15 (6 total moves to make, need to choose 2 norths).
4	Two spiders, Jim and Lori, want to shake hands (each offering just one hand out of eight). How many different ways can they accomplish this? **ANSWER**: 64.
5	How many numbers between 0 and 60 are prime? **ANSWER**: 17.
6	The age of a mathematician, Hilary, and her son, Ken, added together is 49. In 3 years, Hilary will be 4 times as old as Ken. How old is Hilary? **ANSWER**: 41.
7	How many 7s appear between 1 and 100? **ANSWER**: 20.
8	How many ways can 2 cards be chosen from a deck of 52 cards? **ANSWER**: 1326.
9	How many committees of 4 cats and 2 dogs be formed from a group of 5 cats and 6 dogs? **ANSWER**: 75.
10	How many diagonals are there in a 20-sided polygon? **ANSWER**: 180 (20^2 double counts them and includes the 20 sides.).
11	What is the average number of days in a year over any stretch of four consecutive years? **ANSWER**: 365.25.
12	A standard six-sided die is rolled twice. Expressed as a fraction in lowest terms, what is the probability that the sum of the two rolled numbers is less than 5? **ANSWER**: $\frac{1}{6}$.
13	In how many ways can 6 boys and 6 girls be teamed into pairs if each pair must contain one girl? **ANSWER**: 720.
14	A football player has measured his vertical jump at 20, 19, an 23 inches in three attempts. How high must he jump the fourth time to average 21 inches? **ANSWER**: 22.
15	Two baseball teams, the Rockies and the Cubs, start a 7-game series. In how many different ways can the Rockies win the series four games to two? **ANSWER**: 10 – the Rockies need to win game six and 3 of the first 5 (so 5 choose 3).