

March Madness MATH

The Men's National College Basketball Tournament is played each March and the tourney is often referred to as "March Madness." Millions of people watch the tournament and enter pools to see who can pick the most games correctly. 68 college basketball teams are invited to the tourney. Eight of the teams have to play in a play-in game in order to get into the field of 64.

The field of 64 includes four regional tournaments with teams seeded 1 through 16. There are four number one seeds, one for each region. The number one seeds are the top four teams in the tournament. The 16th seeds are the generally worst teams in the tournament or teams 61 – 64.

1. The tournament was founded in 1939. Assuming the tourney has been played every year since 1939, for how many years has the tournament been played? (Actually, the tournament was cancelled in 2020 because of the Covid pandemic.)
2. The UCLA Bruins have won the tournament the most times, with 11 championships. About what percent of the total tournaments have the Bruins won?
3. Since the inception of the 64-team tournament in 1985, each seed-pairing has played **a total of 108 first-round games**. The tournament is set up in a way that it is split into four different regional tournaments. In each region the top seed or the #1 seed plays the lowest seed, the #16 seed. The #2 seed plays the #15 seed, the #3 seed plays the #14 seed and so on. In 108 games a #1 seed has never lost to a #16 seed. This is not the case for the other higher seeded teams. Estimate the winning percentage for each seed below.

Seed	Times this seeded team has won out of 128 games.	Approximate Winning Percentage
1	127	
2	121	
3	110	
4	100	
5	84	
6	81	
7	75	
8	57	
9	71	
10	52	
11	47	
12	44	
13	28	
14	18	
15	7	
16	1	

4. On another sheet of paper create a bar graph for the data in the table. Let the x-axis be seed number and the y-axis be number of wins.
5. Looking at your bar graph and at the data in your table, what do you notice? Is there a general relationship between seed number and number of first round wins? If so, describe it and describe any data that deviates from this relationship.

6. **Patterns?** Once the eight teams have had their play-in games and the 64 team field is set, the first round and the real madness begins. A total of 64 teams play in the first round. How many games are played in the first round?
7. For each round, half the teams lose and go home and half the teams win and advance to the next round. Fill in the number of teams playing and the number of games played in each round. How many total games are played in the six rounds? What patterns do you see? What else do you notice?

Round:	Teams playing in that round:	Number of games played in round:
1	64	
2		
3		
4		
5		
6		

Big Numbers?

Every year millions of people fill out tournament brackets in office pools, among friends or online.

Last year, 36.5 million brackets were filled out. The following questions assume a 64-team tournament after the four play-in games:

8. There are 2^{32} possibilities for the winners in the first round. Make an estimate for the number of different outcomes that could occur in the first round. Check your estimate by using a calculator to find the exact value of 2^{32} . Is this number in the millions, billions, trillions or something else?
9. When all 36.5 million brackets were filled out, roughly what was the probability that one of the brackets had picked all first round games correctly?

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Sources: http://en.wikipedia.org/wiki/NCAA_Men%27s_Division_I_Basketball_Championship
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