



EXAMPLE 2 Finding a Theoretical Probability

The NBA Draft Lottery is an annual event held by the National Basketball Association. The 14 teams that missed the playoffs in the previous season participate in a lottery to determine the order for drafting players. The lottery is weighted so that the team with the worst record has the best chance of obtaining a higher draft pick. The lottery determines the first three picks of the draft.

1. 250 combinations
2. 199 combinations
3. 156 combinations
4. 119 combinations
5. 88 combinations
6. 63 combinations
7. 43 combinations
8. 28 combinations
9. 17 combinations
10. 11 combinations
11. 8 combinations
12. 7 combinations
13. 6 combinations
14. 5 combinations

The NBA Draft Lottery

The 14 teams are ordered (from worst to best) and randomly given 4-digit combinations, as shown at the left.

To conduct the lottery, 14 balls numbered 1 through 14 are put into a lottery machine. Four of the numbers are drawn. The team that has that combination of numbers (order does not matter) wins the first pick. There are 1001 possible combinations of 4 numbers (from 1 through 14). However, the combination 11-12-13-14 does not qualify, leaving only 1000 valid combinations.

- a. What is the probability that the team with the worst record wins the first pick?
- b. What is the probability that team #14 wins the first pick?

SOLUTION

a. Probability = $\frac{250}{1000} = \frac{1}{4} = 25\%$

b. Probability = $\frac{5}{1000} = \frac{1}{200} = 0.5\%$

The National Basketball Association (NBA) is the leading professional basketball league in North America. It has 30 teams. It was formed in 1949 when the National Basketball League merged with the Basketball Association of America.

✓ Checkpoint

Enter the number of combinations for each of the 14 teams in the NBA Draft Lottery into a spreadsheet.

- c. Use the spreadsheet to find the probability that each team wins the first pick.
- d. Find the total of the probabilities column. What can you conclude?

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	A	B	C
1	Team	Combinations	Probability of 1st Pick
2	1	250	25.0%
3	2	199	
4	3	156	
5	4	119	
6	5	88	
7	6	63	
8	7	43	
9	8	28	
10			