

## Permutations vs Combinations

**State if each scenario involves a permutation or a combination.**

- 1) A team of 8 basketball players needs to choose a captain and co-captain.
- 2) Rob and Mary are planning trips to nine countries this year. There are 13 countries they would like to visit. They are deciding which countries to skip.
- 3) The batting order for seven players on a 12 person team.
- 4) There are 45 applicants for three Computer Programmer positions.

**State if each scenario involves a permutation or a combination. Then find the number of possibilities.**

- 5) Castel and Joe are planning trips to three countries this year. There are 7 countries they would like to visit. One trip will be one week long, another two days, and the other two weeks.
- 6) There are 110 people at a meeting. They each shake hands with everyone else. How many handshakes were there?
- 7) You are setting the combination on a three-digit lock. You want to use the numbers 123 but don't care what order they are in.
- 8) A group of 25 people are going to run a race. The top 8 finishers advance to the finals.
- 9) A team of 17 softball players needs to choose three players to refill the water cooler.
- 10) 5 out of 13 students will ride in a car instead of a van
- 11) The student body of 10 students wants to elect a president, vice president, secretary, and treasurer.
- 12) Selecting which seven players will be in the batting order on a 11 person team.
- 13) There are 15 applicants for four jobs: Computer Programmer, Software Tester, Manager, and Systems Engineer.
- 14) A group of 45 people are going to run a race. The top three runners earn gold, silver, and bronze medals.

## Answers

**State if each scenario involves a permutation or a combination.**

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|---|---|
| 1) A team of 8 basketball players needs to choose a captain and co-captain.<br><b>Permutation</b> | 2) Rob and Mary are planning trips to nine countries this year. There are 13 countries they would like to visit. They are deciding which countries to skip.<br><b>Combination</b> |
| 3) The batting order for seven players on a 12 person team.<br><b>Permutation</b>                 | 4) There are 45 applicants for three Computer Programmer positions.<br><b>Combination</b>   |

**State if each scenario involves a permutation or a combination. Then find the number of possibilities.**

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| 5) Castel and Joe are planning trips to three countries this year. There are 7 countries they would like to visit. One trip will be one week long, another two days, and the other two weeks.<br><b>Permutation: 210</b> | 6) There are 110 people at a meeting. They each shake hands with everyone else. How many handshakes were there?<br><b>Combination: 5,995</b> |
| 7) You are setting the combination on a three-digit lock. You want to use the numbers 123 but don't care what order they are in.<br><b>Permutation: 6</b>  | 8) A group of 25 people are going to run a race. The top 8 finishers advance to the finals.<br><b>Combination: 1,081,575</b>                 |
| 9) A team of 17 softball players needs to choose three players to refill the water cooler.<br><b>Combination: 680</b>  | 10) 5 out of 13 students will ride in a car instead of a van<br><b>Combination: 1,287</b>  |
| 11) The student body of 10 students wants to elect a president, vice president, secretary, and treasurer.<br><b>Permutation: 5,040</b>   | 12) Selecting which seven players will be in the batting order on a 11 person team.<br><b>Combination: 330</b>                               |
| 13) There are 15 applicants for four jobs: Computer Programmer, Software Tester, Manager, and Systems Engineer.<br><b>Permutation: 32,760</b>  | 14) A group of 45 people are going to run a race. The top three runners earn gold, silver, and bronze medals.<br><b>Permutation: 85,140</b>  |