

**Evaluate each expression.**

1)  ${}_{19}C_{16}$

- A) 1,046      B) 1,031  
C) 969      D) 2,907

2)  ${}_{11}C_5$

- A) 462      B) 284  
C) 924      D) 55,440

3)  ${}_8P_4$

- A) 1,680      B) 1,280  
C) 336      D) 70

4)  ${}_6P_3$

- A) 120      B) 40  
C) 240      D) 20

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

5) Castel and Alberto are planning trips to two countries this year. There are 12 countries they would like to visit. One trip will be one week long and the other two weeks.

- A) Permutation      B) Combination

6) A group of 28 people need to take an elevator to the top floor. They will go in groups of seven. They are deciding who will take the elevator on its second trip.

- A) Combination      B) Permutation

**Find the number of possibilities in each scenario.**

7) The batting order for nine players on a 11 person team.

- A) 18,983,752      B) 19,958,400  
C) 55      D) 18,979,321

8) The student body of 45 students wants to elect a president, vice president, secretary, and treasurer.

- A) 893,970      B) 1,191,960  
C) 2,608,355      D) 3,575,880

9) A team of 10 softball players needs to choose two players to refill the water cooler.

- A) 59      B) 180  
C) 46      D) 45

10) Bill and Eduardo are planning trips to two countries this year. There are 4 countries they would like to visit. They are deciding which countries to skip.

- A) 6      B) 1      C) 3      D) 12

**Find the probability of each event.**

11) A basketball player has a 50% chance of making each free throw. What is the probability that the player makes exactly three out of seven free throws?

- A)  $\frac{9}{128} \approx 7.031\%$   
B)  $\frac{35}{128} \approx 27.344\%$   
C)  $\frac{231}{1024} \approx 22.559\%$   
D)  $\frac{495}{4096} \approx 12.085\%$

12) One day, seven babies are born at a hospital. Assuming each baby has an equal chance of being a boy or girl, what is the probability that exactly two of the seven babies are girls?

- A)  $\frac{165}{1024} \approx 16.113\%$   
B)  $\frac{35}{128} \approx 27.344\%$   
C)  $\frac{15}{64} \approx 23.438\%$   
D)  $\frac{21}{128} \approx 16.406\%$