Permutations and Combinations 11.9

Overview of problems

🚩   *Example Set: A*

Determine if the questions are permutations or combinations:

1. How many ways four boys can be picked from a group of 30 boys?

2. How many three letter arrangements ("words") can be made from the letters ABCDEFG?

3. An online music app offers six free song downloads for signing up from a list of 130 different songs. How many different sign up offers are possible for people to download?

4. A ship has eight flags for signaling to other ships. Each signal the ship raises is made up of three flags. How many different signals are possible for the ship to send?

Calculate the following permutations or combinations:

5. $_4P_2$

6. $_{15}P_2$

7. $_6C_4$

8. $_{21}C_{14}$

Permutations and Combinations 11.9

Overview of problems

🚩   *Example Set: B*

Answer the following permutations and combinations - show all work:

1. How many ways four boys can be picked from a group of 30 boys?

2. How many three letter arrangements ("words") can be made from the letters ABCDEFG?

3. An online music app offers six free song downloads for signing up from a list of 130 different songs. How many different sign up offers are possible for people to download?

4. A ship has eight flags for signaling to other ships. Each signal the ship raises is made up of three flags. How many different signals are possible for the ship to send?

🚩   *Example Set: C*

Answer the following permutations and combinations - show all work:

1. A car company is designing a new vehicle of which they are considering 4 different headlights, 2 grilles and 5 front fenders for the final product. How many designs can be made using these three different front-end options?

Overview of problems

2. A restaurant offers a Monday lunch special where people can select from 2 appetizers, 4 entrees and 5 desserts; how many unique meals are possible under the special?

3. A man needs to get ready for an interview – he must select his suit from 2 jackets, 3 shirts and 5 ties; how many different suits can be formed using 1 jacket, 1 shirt and 1 tie?

4. A band needs the following new members: 2 guitar players, a bass player, a drummer and 2 saxophone players. During the auditions 5 guitar players, 4 bass players, 3 drummers and 10 saxophone players try out. How many possible combinations of players does the band have to select it's new members?

🚩   *Example Set: A -***ANSWER KEY**

Determine if the questions are permutations or combinations:

1. How many ways four boys can be picked from a group of 30 boys?

   Combination- order not important

2. How many three letter arrangements ("words") can be made from the letters ABCDEFG?

   Permutation- order is important

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3. An online music app offers six free song downloads for signing up from a list of 130 different songs. How many different sign up offers are possible for people to download?

Combination- order not important

4. A ship has eight flags for signaling to other ships. Each signal the ship raises is made up of three flags. How many different signals are possible for the ship to send?

Permutation- order is important

Calculate the following permutations or combinations:

5. $_4P_2$ 12

6. $_{15}P_2$ 210

7. $_6C_4$ 15

8. $_{21}C_{14}$ 116,280

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🚩 *Example Set: B - **ANSWER KEY***

Answer the following permutations and combinations - show all work:

1. How many ways four boys can be picked from a group of 30 boys?

   27,405

2. How many three letter arrangements ("words") can be made from the letters ABCDEFG?

   210

3. An online music app offers six free song downloads for signing up from a list of 130 different songs. How many different sign up offers are possible for people to download?

   5,963,412,000

4. A ship has eight flags for signaling to other ships. Each signal the ship raises is made up of three flags. How many different signals are possible for the ship to send?

   336

Overview of problems

🚩 *Example Set: C - **ANSWER KEY***

Answer the following permutations and combinations - show all work:

1. A car company is designing a new vehicle of which they are considering 4 different headlights, 2 grilles and 5 front fenders for the final product. How many designs can be made using these three different front-end options?

   40

2. A restaurant offers a Monday lunch special where people can select from 2 appetizers, 4 entrees and 5 desserts; how many unique meals are possible under the special?

   40

3. A man needs to get ready for an interview – he must select his suit from 2 jackets, 3 shirts and 5 ties; how many different suits can be formed using 1 jacket, 1 shirt and 1 tie?

   30

4. A band needs the following new members: 2 guitar players, a bass player, a drummer and 2 saxophone players. During the auditions 5 guitar players, 4 bass players, 3 drummers and 10 saxophone players try out. How many possible combinations of players does the band have to select it's new members?

   5400