Permutations And Combinations Worksheet Answer Key PDF

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Part 1: Foundational Knowledge

What is the definition of a permutation?

undefined. A) An arrangement of objects where order does not matter

undefined. B) A selection of objects where order does not matter

undefined. C) An arrangement of objects in a specific order ✓

undefined. D) A selection of objects in a specific order

A permutation is an arrangement of objects in a specific order.

Which of the following statements are true about combinations?

undefined. A) Order matters

undefined. B) Order does not matter ✓

undefined. C) Used for selecting teams ✓

undefined. D) Used for seating arrangements

In combinations, order does not matter, and they are used for selections.

Explain the difference between permutations and combinations in your own words.

Permutations involve arrangements where order matters, while combinations involve selections where order does not matter.

List the formula for calculating permutations and the formula for calculating combinations.

1. What is the formula for permutations?

nPr = n! / (n - r)!

2. What is the formula for combinations?

nC = n! / [r!(n - r)!]

The formula for permutations is nPr = n! / (n - r)!, and for combinations, it is nC = n! / [r!(n - r)!].

Part 2: comprehension

If you have 5 books and want to arrange 3 of them on a shelf, which concept would you use?

undefined. A) Permutation ✓
undefined. B) Combination
undefined. C) Both
undefined. D) Neither

You would use permutations because the order of the books matters.

Which scenarios would require the use of combinations?

undefined. A) Choosing 3 out of 10 songs to play ✓
undefined. B) Arranging 5 students in a line
undefined. C) Selecting 2 toppings for a pizza ✓
undefined. D) Assigninging seats to 4 friends

Scenarios that involve selections without regard to order require combinations.

Describe a real-world scenario where permutations would be necessary and explain why.

An example could be arranging a lineup for a performance, where the order of performers is crucial.

Part 3: Application

How many ways can you arrange 4 out of 7 different paintings on a wall?

undefined. A) 35
undefined. B) 840 ✓
undefined. C) 210
undefined. D) 24

The number of ways to arrange 4 out of 7 paintings is calculated using permutations.

In how many ways can a committee of 3 be formed from a group of 8 people?

undefined. A) 56 ✓
undefined. B) 336
undefined. C) 24
undefined. D) 120

The number of ways to form a committee of 3 from 8 people is calculated using combinations.

A school club has 10 members. How many ways can they elect a president, vice-president, and secretary? Show your calculations.

The number of ways to elect the officers is calculated using permutations, as the order of selection matters.

Part 4: Analysis

Which of the following best explains why combinations are used instead of permutations in forming a committee?

undefined. A) The order of selection is important
undefined. B) The order of selection is not important ✓
undefined. C) It results in more possible outcomes
undefined. D) It results in fewer possible outcomes

In forming a committee, the order of selection is not important, hence combinations are used.

Analyze the following scenarios and identify which involve permutations:

undefined. A) Assigninging roles to actors in a play ✓
undefined. B) Selecting fruits for a fruit salad
undefined. C) Arranging books on a shelf ✓
undefined. D) Choosing members for a debate team

Scenarios involving arrangements where order matters are permutations.

Compare and contrast the use of permutations and combinations in the context of organizing a sports tournament.

Permutations may be used for scheduling matches, while combinations may be used for selecting teams.

Part 5: Evaluation and Creation

Which method would you use to determine the number of different ways to arrange the letters in the word 'GARDEN'?

undefined. A) Permutation ✓
undefined. B) Combination
undefined. C) Both
undefined. D) Neither

You would use permutations to arrange the letters in 'GARDEN' as the order matters.

Evaluate the following situations and decide which involve combinations:

undefined. A) Formulating a study group from a class ✓
undefined. B) Arranging trophies on a shelf
undefined. C) Selecting questions for a quiz ✓
undefined. D) Ordering books by publication date

Situations that involve selections without regard to order involve combinations.

Create a problem involving permutations or combinations, and provide a solution. Describe the scenario and explain your reasoning.

An example could be creating a seating arrangement for a dinner party, explaining the reasoning behind the arrangement.