

This is a specimen paper.

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- 1 The letters of STATISTICS are printed so each letter is on a separate card.
 - a) Calculate how many different arrangements of the cards (not the letters) can be made.
 - b) Calculate how many different arrangements of the letters can be made.
 - c) Calculate in how many different arrangements of letters can be made such when all 3 Ss are together.

- 2 A man has 2 jackets, 2 ties, 3 shirts and 4 pair of trousers (pants). Calculate how many different outfits he can wear.

- 3 Eighteen tickets are sold and six of the tickets will win a prize. Ten of the ticket holders are adults and eight are children.
 - a) Calculate how many different combinations of winners there can be.
 - b) Calculate how many different combinations there are, such that all the winners will be children.

- 4 The numbers 5 6 7 8 9 are placed on a separate cards.
 - a) Calculate how many 5 digit numbers can be made from the cards.
 - b) Calculate how many of these numbers will be odd.
 - c) Calculate how many of these numbers will be greater than 70000.

- 5 Three girls and four boys are to sit in seats in a row. How many ways are there such that the boys and girls will alternate in the seats, e.g. boy, girl, boy, girl, etc.

- 6 Anna and Bert are meeting Charlie, Deena and Enid at the cinema. Anna and Bert must sit next to each other. Calculate how many different seating arrangements there are.

- 7
- Five people sit in a line. Calculate how many different seating arrangements can be made.
 - Calculate how many different seating arrangements can be made if the five people sit in a circle.
 - n people sit in a line. Calculate how many different seating arrangements can be made.
 - Calculate how many different seating arrangements can be made if the n people sit in a circle.
- 8
- A committee of 5 is to be selected from 6 men and 8 women.
- Calculate how many different combinations of this committee can be made.
 - If at least one man and one woman must be on the committee, calculate how many different combinations of this committee can be made.
 - A husband and wife are amongst the 14 people. They are not allowed to sit on the committee together. Calculate how many different combinations of this committee can be made.
- 9
- In the 100 metres Olympic final, 3 athletes from Jamaica, 2 from the USA, and 1 each from England, Germany, and South African line up.
- Calculate in how many different ways they can line up if there are no restrictions.
 - Calculate in how many different ways they can line up if all three Jamaicans must be next to each other.
 - Calculate in how many different ways they can line up if the Jamaicans must not be next to each other.
- 10
- Calculate how many 4 digit numbers can be formed using the digits from 0 to 9.
 - Calculate how many of these numbers will be greater than 5000.

Answers

- 1 a) $10! = 362880$
b) $\frac{10!}{3!3!2!} = 50400$
c) $\frac{8!}{3!2!} = 3360$
- 2 48
- 3 a) 18564
b) 28
- 4 a) 120
b) 72
c) 72
- 5 144
- 6 48
- 7 a) 120
b) 24
c) $n!$
d) $(n-1)!$
- 8 a) 2002
b) 220
c) 1782
- 9 a) 40320
b) 4320
c) 14400
- 10 a) 4536
b) 2520