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JC MATHEMATICS (H2) STUDY TIPS

**CONVERTING PERMUTATIONS
INTO PROBABILITY: SIMPLE YET
HIGHLY CRUCIAL**

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JC_H2Maths_048



• Permutation and Combination

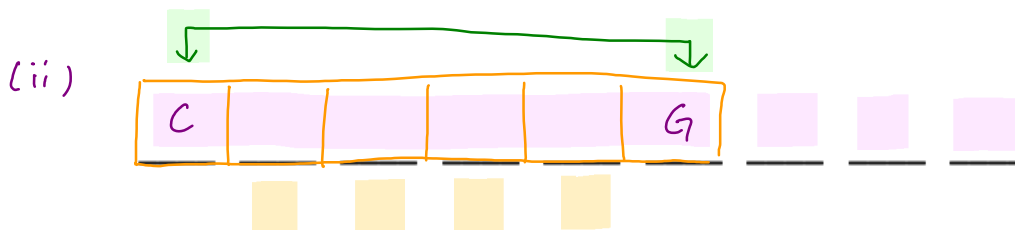
Example 14

Four girls Alice, Brenda, Cindy and Dawn, and five boys Eric, Fredrick, Gary, Herman and Ian, stand in a queue in random order. Find the exact probability that

- Fredrick is the first and Alice is the fourth in the queue,
- there are four people between Cindy and Gary.



$$\therefore \text{Required probability} = \frac{7!}{9!} = \frac{1}{72}$$



$$\therefore \text{Required probability} = \frac{{}^7C_4 \times 4! \times 4! \times 2!}{9!} = \frac{1}{9}$$



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Explanation

While this problem relies heavily on the principles of permutations and combinations to count arrangements, its ultimate goal is to determine a probability rather than a final count.

To achieve this, the solution structures the scenario as a fraction. The denominator represents the total number of possible ways the entire group can line up without any restrictions.

By placing the specific restricted arrangements over this total unrestricted count, the counting exercise is successfully converted into a probability.

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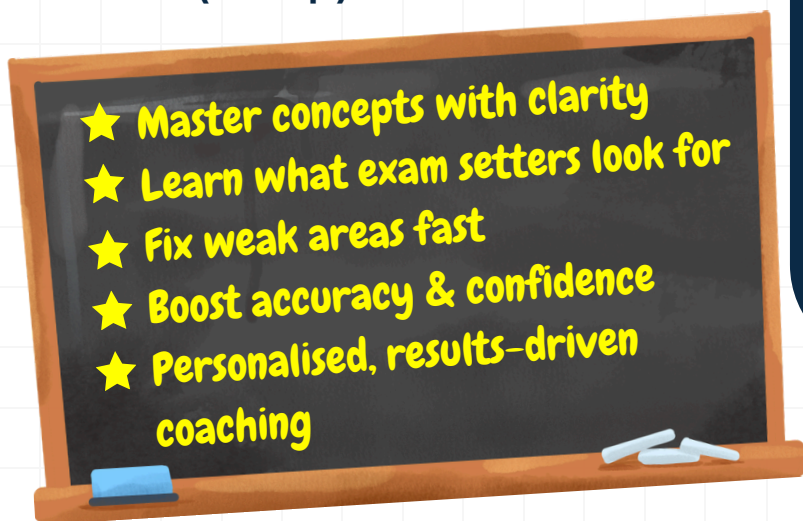
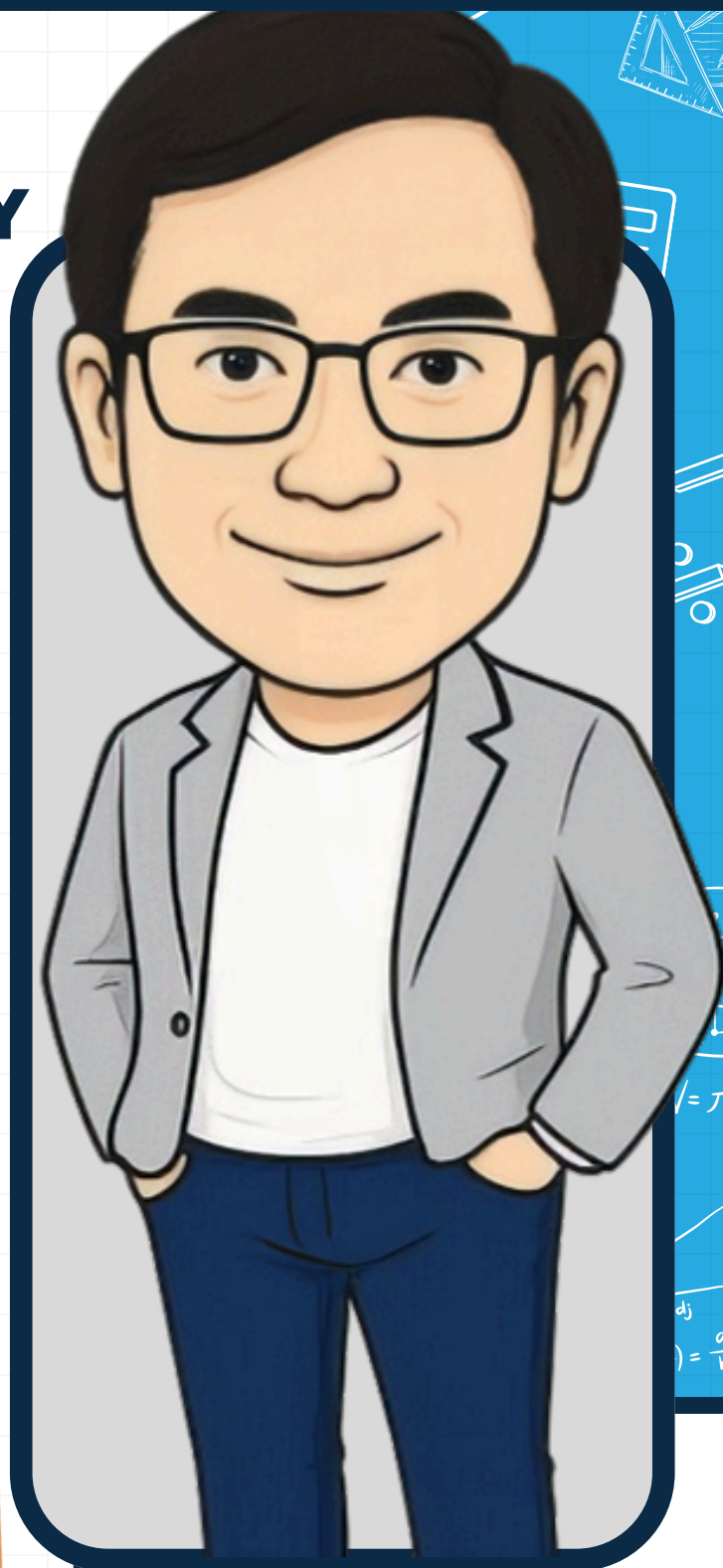
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MATHS TUITION BY MR JACKIE LEE

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- ✓ Former MOE Scholar
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