Permutations

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Count ordered selections of 3 different letters from A, B, C, D, E. [2 marks]

$5P_3 = 5 \times 4 \times 3 = 60$.

Answer: 60.

2. Seven runners compete for first and second. Count the ordered results. [2 marks]

$7 \times 6 = 42$.

Answer: 42.

3. How many rows of 6 distinct students have Ava first? [2 marks]

Fix Ava, then arrange the other 5: $5! = 120$.

Answer: 120.

4. How many rows of 6 distinct students have Ava and Ben adjacent? [3 marks]

Arrange the pair block and 4 others in $5!$ ways.

Multiply by 2 orders of the pair: 240.

Answer: 240.

5. Count distinct arrangements of the letters in LEVEL. [3 marks]

There are 5 letters with L repeated twice and E repeated twice.

$5!/(2!\,2!) = 30$.

Answer: 30.

6. From 8 people choose 3 ordered speakers. One particular person must speak first. Count the schedules. [2 marks]

Fix that person first.

Choose the next two in $7 \times 6 = 42$ ways.

Answer: 42.