

# Quiz 1

This quiz is graded out of 15 marks. No books, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

**Question 1.** (5 marks) How many orderings are there of the 8 letters in the word: **CALCULUS**

$$\# \text{ of orderings} = \frac{8!}{2!2!2!} = \underline{5040}$$

8! : due to 8 letters in the word  
CALCULUS

2! : FOR EACH OF THE duplicate letters  
U, L & C

**Question 2.** (5 marks) How many different ways are there of sitting 6 students and 3 teachers in a row of 14 seats if a teacher must be seated in the first seat.

CHAIRS      1 2 3 4 5 6 7 8 9 10 11 12 13 14

                  ↑

3 possibilities  
for chair 1

FOR REMAINDER OF chairs 8 people  
& 13 chairs       ${}_{13}P_8$   
(select 8 chairs for each individual,  
order MATTERS)

$$\# \text{ of possibilities} = 3 \times \frac{13!}{(13-8)!} = 3 \times \frac{13!}{5!}$$

$$= \underline{155,675,520}$$

**Question 3.** (5 marks) How many different soccer teams (11-players) can be formed from a group of 40 people?

$$\# \text{ of different TEAMS} = \underline{40C_{11} = 2,311,801,440}$$

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Question 1. (5 marks) How many orderings are there of the 7 letters in the word: ASSUMES

$$\# \text{ orderings} = \frac{7!}{3!} = \underline{840}$$

Question 2. (5 marks) How many different ways are there of sitting 5 students and 4 teachers in a row of 12 seats if a student must be seated in the first seat.

1
2
3
4
5
6
7
8
9
10
11
12

5 CHOICES OF STUDENT FOR SEAT 1

11 chairs & 8 people to order

$\left. \begin{array}{l} 11 P_8 \\ \text{OR} \\ 8! \cdot 11 C_8 \end{array} \right\}$

← CHOOSING THE 8 chairs

ordering OF 8 people

$$\# \text{ orderings} = 5 \times \frac{8! \cdot 11!}{8! \cdot 3!}$$

$$= \underline{33,264,000}$$

Question 3. (5 marks) How many different hockey teams (6-players) can be formed from a group of 30 people?

$$\# \text{ orderings} = 30 C_6 = \underline{593,775}$$