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PRN - B24CE1079
SUB - Mathematical Foundation for GenAI
ASSIGNMENT 4 - COMBINATIONS

CODE

```
/*PROBLEM STATEMENT:
A school has selected a group of 20 students for a debate competition. The task is to determine
the number of different teams of 3 students that can be formed from this group. This involves
calculating combinations, where the order of selection does not matter.*/

#include <iostream>
using namespace std;

// Function to calculate factorial
long long factorial(int num) {
    long long fact = 1;
    for (int i = 1; i <= num; i++) {
        fact *= i;
    }
    return fact;
}

int main() {
    int n = 20; // total number students
    int r = 3;  // team size

    cout << "Total number of students: " << n << endl;
    cout << "Number of students selected: " << r << endl;

    // Using nCr formula
    long long combinations = factorial(n) / (factorial(r) * factorial(n - r));

    cout << "Total number of ways to form a team: " << combinations << endl;
    return 0;
}
```

```
Total number of students: 20
Number of students selected: 3
Total number of ways to form a team: 1140
```