

Chapter 1 / **Example 47**


# Calculating values using factorials

There are eight boys and five girls who attend the Senior Mathematics Club. Find how many ways the teacher can choose a team of six students to represent the school in a competition if:

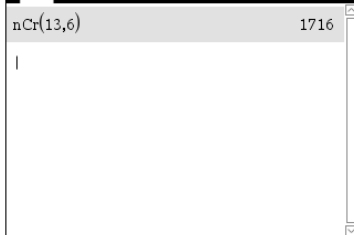
- a** There are no gender restrictions.
- b** The team is to be made up of three girls and three boys.
- c** At least two of each gender are included in the team.

Open a new document and add a Calculator page.



Press  5:Probability | 3:Combinations


Type 13, 6 and press .

$${}^{13}C_6 = 1716.$$



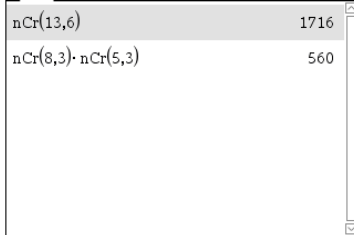
|           |      |
|-----------|------|
| nCr(13,6) | 1716 |
|-----------|------|

Press  5:Probability | 3:Combinations and type 8,3. Press .



Press  $\times$ , press  5:Probability | 3:Combinations and type 5,3.



Press .



$${}^8C_3 \times {}^5C_3 = 560.$$







|                     |      |
|---------------------|------|
| nCr(13,6)           | 1716 |
| nCr(8,3) * nCr(5,3) | 560  |



Press  5:Probability | 3:Combinations, type 13,6 and press .


Press  $-$ , press  5:Probability | 3:Combinations, type 8,5 and press .

Press  $\times$ , press  5:Probability | 3:Combinations, type 5,1 and press .

Press  $-$ , press  5:Probability | 3:Combinations, type 8,6 and press .

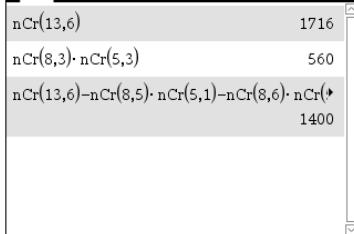
Press  $\times$ , press  5:Probability | 3:Combinations, type 5,0 and press .

Press  $-$ , press  5:Probability | 3:Combinations, type 8,1 and press .

Press  $\times$ , press  5:Probability | 3:Combinations and type 5,5.

Press .

$${}^{13}C_6 - {}^8C_5 \times {}^5C_1 - {}^8C_6 \times {}^5C_0 - {}^8C_1 \times {}^5C_5 = 1400.$$



|                                                       |      |
|-------------------------------------------------------|------|
| nCr(13,6)                                             | 1716 |
| nCr(8,3) * nCr(5,3)                                   | 560  |
| nCr(13,6) - nCr(8,5) * nCr(5,1) - nCr(8,6) * nCr(5,0) | 1400 |

Chapter 1 / **Example 47****Calculating values using factorials**

Press **menu** 5:Probability | 3:Combinations, type 8,2 and press **►**.

Press **×**, press **menu** 5:Probability | 3:Combinations, type 5,4 and press **►**.

Press **+**, press **menu** 5:Probability | 3:Combinations, type 8,3 and press **►**.

Press **×**, press **menu** 5:Probability | 3:Combinations, type 5,3 and press **►**.

Press **+**, press **menu** 5:Probability | 3:Combinations, type 8,4 and press **►**.

Press **×**, press **menu** 5:Probability | 3:Combinations, type 5,2.

Press **enter**.

$${}^8C_2 \times {}^5C_4 + {}^8C_3 \times {}^5C_3 + {}^8C_4 \times {}^5C_2 = 1400.$$

|                                                                               |      |
|-------------------------------------------------------------------------------|------|
| $nCr(13,6)$                                                                   | 1716 |
| $nCr(8,3) \cdot nCr(5,3)$                                                     | 560  |
| $nCr(13,6) - nCr(8,5) \cdot nCr(5,1) - nCr(8,6) \cdot nCr(5,0)$               | 1400 |
| $nCr(8,2) \cdot nCr(5,4) + nCr(8,3) \cdot nCr(5,3) + nCr(8,4) \cdot nCr(5,2)$ | 1400 |