



Self-assessment: 1 Counting principles

1. Calculate the number of ways to do each of the following:

- (a) Select 5 students out of a class of 18 to attend a conference.
- (b) Arrange 7 books on a shelf.
- (c) Give a red, a blue and a green pen to 3 out of 7 children (each of the 3 children gets 1 pen).

(accessible to students on the path to grade 3 or 4) [4 marks]

2. A group of 5 students is selected from a class of 12 boys and 10 girls. How many such groups contain either 1 or 2 girls?

(accessible to students on the path to grade 3 or 4) [5 marks]

3. In how many ways can 9 children sit in a row if Annie and Danny want to sit next to each other?

(accessible to students on the path to grade 3 or 4) [3 marks]

4. How many different arrangements of the letters of the word EQUATION have all the consonants separated?

(accessible to students on the path to grade 5 or 6) [4 marks]

5. Dana has 5 Biology books and 3 History books she wants to arrange on a single shelf. (The books are all different).

- (a) How many ways are there to arrange the 8 books?
- (b) (i) In how many ways can the books be arranged if all the History books need to be next to each other?
- (ii) How many arrangements are there in which all the History books are next to each other and all the Biology books are next to each other?

(accessible to students on the path to grade 3 or 4)



- (c) Theo wants to select 3 Biology books and 1 History book from Dana's shelf. How many different selections are possible?
- (d) Aseem has a certain number of Economics books. Given that he can make 45 different selections of 2 books, how many books does he have?

(accessible to students on the path to grade 5 or 6)

[12 marks]