Chapter notes: 7 Binomial expansion

Overview

This chapter has no prerequisites. A relatively small chapter, we think it needs approximately two teaching hours.

Introductory problem

This problem highlights an important use of the binomial expansion. You might like to put it into an historical context – hundreds of years ago people did have to do calculations like this manually. The worked solution is given at the end of the chapter, page 174; the idea being that students should be able to answer the question using the methods covered in the chapter.

7A Introduction to the binomial theorem, p161

There are no specific teacher notes for this section.

7B Binomial coefficients, p164

Pascal's triangle is a good source of patterns and ideas for exploration. It has links to triangular numbers, Fibonacci numbers, fractals and much more. The fractal formed by the shading described in the 'Research explorer' box is called Sierpinski's triangle.

Binomial coefficients can be linked to counting, but this is not on the SL syllabus.

Hints for the grade 7 questions:

6. The formula for binomial coefficients is required.

7C Applying the binomial theorem, p166

Hints for the grade 7 questions:

15. (a) Think either about the first coefficient or the powers of y.

16. You can try to work out which term you need (by writing $x^k\left(\frac{1}{\sqrt{x}}\right)^{5-k} = x^2$) or just write out the whole expansion.

17. As above.

18. As above.

21. You will need to use the factorial form of the binomial coefficient.