1 Number and algebra

Activity: Pascal’s triangle and binomial expressions

This diagram shows the first five lines of Pascal’s triangle.

A close up of a piece of paper

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**1** Write down as many patterns as can you see in the triangle.   
Explain each pattern in your own words, using algebra where possible.

**2** Write down the numbers in the 6th line. Explain how you calculated these numbers.

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**3** Are there any new patterns that you have noticed?

**4** Expand and simplify each of the following.

a)

b)

c) *Hint: Take your answer from and multiply it by .*

d)  *Hint: Take your answer from and multiply it by*

**5** Complete the missing lines of Pascal’s triangle.

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Here are some results from the expansions in Q4.

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**6** What do you notice about the coefficients[[1]](#footnote-1)\* of *x* and *y* in your answers?

**7** Use your pattern to expand:

a)

b) .

**8** How can you use Pascal’s triangle to help you expand brackets?  
Do the patterns in the numbers help you?  
How could you use the pattern to expand ?

1. \* If you are unsure about the meaning of this word then please ask your teacher. [↑](#footnote-ref-1)