

# Binomial Expansion

For AQA Level 2 Certificate in Further Mathematics (8365)

Name \_\_\_\_\_

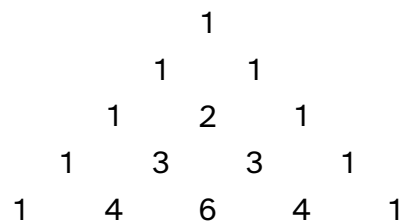
Total marks: **26**

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Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

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- 1** Here are the first five rows of Pascal's triangle.



Write down the row of Pascal's triangle used to expand  $(a + b)^6$

**[1 mark]**

Answer \_\_\_\_\_

- 2** Expand and simplify fully  $(x - 3)^4$

**[3 marks]**

Answer \_\_\_\_\_

**3** Work out the coefficient of  $x^3$  in the expansion of

(a)  $(6 - x)^5$

**[2 marks]**

Answer \_\_\_\_\_

(b)  $(2x - 3)^5$

**[2 marks]**

Answer \_\_\_\_\_

**4** Expand and simplify  $(2 + x)^5 - (2 - x)^5$

**[3 marks]**

Answer \_\_\_\_\_

- 5 Expand and simplify fully  $\left(4 + \frac{x}{2}\right)^4$

[4 marks]

Answer \_\_\_\_\_

- 6 In the expansion of  $(3 - kx)^5$ , the coefficient of  $x^4$  is 1215  
Work out both possible values of  $k$ .

[3 marks]

Answer \_\_\_\_\_ and \_\_\_\_\_

- 7  $a$  is a non-zero constant.

The coefficient of  $x^3$  in the expansion of  $(2 + ax)^5$  is equal to the coefficient of  $x^2$  in the expansion of  $(a - 4x)^4$

Work out the value of  $a$ .

[4 marks]

$a =$  \_\_\_\_\_

- 8 In the expansion of  $(1 + ax)^6$   
the coefficient of  $x^2$  is 48 more than the coefficient of  $x$   
Work out the two possible values of  $a$ .  
You must show your working.

**[4 marks]**

Answer \_\_\_\_\_ and \_\_\_\_\_