

## Binomial expansions

IB SL/HL

1. a) Find the first three terms in the expansion, in ascending powers of  $x^2$  for the expansion of  $(2 - x)^5$ .  
  
b) Find the value of the constant  $a$  for which the coefficient of  $x^4$  in the expansion  $(1 + ax)(2 - x)^5$  is 2.
2. Find the first four terms of  $(1 - 2x)^7$ .
3. Find the binomial expansion of  $(3 + x)^4$ .  
  
Write down also the expansion of  $(3 - x)^4$ .
4. a) Expand, in decreasing powers of  $x$ , up to and including the first 4 terms of  $(3x + p)^6$ .  
  
b) Hence find the value of  $p$ , given that the coefficient of the  $x^3$  is 4320.
5. In one of the terms  $(x^2 - 4y^3)^5$ , the powers of  $x$  and  $y$  will be identical. Find this term, stating the coefficient and showing clearly all your working.

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1. a)  $32 - 80x - 80x^2$                       b)  $a = \frac{1}{5}$
2. a)  $1 - 14x - 42x^2$
3.  $81 + 108x + 54x^2 + 12x^3 + x^4$
4. a)  $729x^6 + 1458x^5p + 1215x^4p^2 + 540x^3p^3$   
b)  $p = 2$
5.  $160x^6y^6$

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Answers

1.