**Self-assessment answers: 8 Binomial expansion**

If there is a question you can’t do, this table shows you which section in the textbook can help you.

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| --- | --- |
| **Question** | **Section or Worked example** |
| 1. (a), (b) | Section 8B (Worked example 8.2) |
| 1. (c) | Worked example 8.4 |
| 2. (a) | Section 8B |
| 2. (b) | Section 8D |
| 3. | Section 8B |
| 4. (b) | Section 8B |
| 4. (c) | Section 8B (Worked example 8.2) |

**1.** (a) (−2)4 = 560

(b) (2)3(5)7 = 75 000 000

(c) 

⇒ 13 −2*k* = 3

⇒ *k* = 5

The coefficient is (1)5(−1)8 = 1287. *[4 marks]*

**2.** (a) 25 −  × 24*x* +  × 23*x*2 = 32 – 5 × 16*x* +  × 8*x*2

= 32 – 80*x* + 80*x*2

(b) 2 – *x* = 1.99 when *x* = 0.01.

32 – 80 × 0.01 + 80 × 0.012 = 32 – 0.8 + 0.008

= 31.208*[7 marks]*

**3.** (a) (1 + 4*x* + 6*x*2 + 4*x*3 + *x*4) + (1 – 4*x* + 6*x*2 – 4*x*3 + *x*4)

= 2 + 12*x*2 + 2*x*4

(b) Let *x* = :

( + 1)4 + ( − 1)4 = 2 + 12()2 + 2()4

= 2 + 12(2) + 2(4) = 34*[7 marks]*

**4.** (a) *x* = 3 −  ∴ *x* +  = 3

(b) (i) 







(ii)  = 9 ⇒ 9 = *x*2 + 2 + 

⇒ *x*2 +  = 7

 = 27 ⇒ 27 = *x*3 + 3*x* + 

⇒ *x*3 +  = 27 − 3

= 27 – 3(3) = 18

(c) The constant term appears when the powers of *x* and  are equal:



⇒ 2*k* – *n* = 0

⇒ *k* = 

So

Using table from GDC:

|  |  |
| --- | --- |
| ***n*** |  |
| 2 | 2 |
| 4 | 6 |
| 6 | 20 |
| 8 | 70 |

∴ *n* = 8*[12 marks]*