

Expand completely.

$$1) (n-2)^6$$

$$= n^6 - 12n^5 + 60n^4 - 160n^3 + 240n^2 - 192n + 64$$

$$2) (3x-1)^5$$

$$= 243x^5 - 405x^4 + 270x^3 - 90x^2 + 15x - 1$$

$$3) (2u+3v)^4$$

$$= 16u^4 + 96u^3v + 216u^2v^2 + 216uv^3 + 81v^4$$

$$4) (y+2x)^3$$

$$= y^3 + 6xy^2 + 12x^2y + 8x^3$$

Find each coefficient described.

5) Coefficient of a in expansion of $(a-2)^3$

$$3(a)(2)^2 = 12a$$

(12)

6) Coefficient of xy^3 in expansion of $(x+3y)^4$

$$4(x)(3y)^3 = 108xy^3$$

(108)

7) Coefficient of y^2 in expansion of $(y+3)^5$

$$10(y)^2(3)^3 = 270y^2$$

(270)

8) Coefficient of x^2y in expansion of $(4x+y)^3$

$$3(4x)^2(y) = 48x^2y$$

(48)

Find each term described.

9) 2nd term in expansion of $(m-3n)^4$

$$-4(m)^3(3n)$$

$(-12m^3n)$

10) 4th term in expansion of $(b+2a)^3$

$$1(b)^0(2a)^3$$

$(8a^3)$

11) 3rd term in expansion of $(2n+m)^4$

$$6(2n)^2(m)^2$$

$(24m^2n^2)$

12) 2nd term in expansion of $(y-5)^3$

$$-3(y)^2(5)$$

$(-15y^2)$

1 3 2 3 1
4 6 4
5 10 10 5
6 15 20 15 6
7 21 35 35 21 7

1. Find the coefficient of a^3b^4 in the expansion of $(5a+b)^7$.

$$35(5a)^3(b)^4 = 4375a^3b^4$$

4375

2. Consider the expansion of $(x+2)^{11}$.

(a) Write down the number of terms in this expansion. 12 terms

(b) Find the term containing x^2 .

$$55(x)^2(2)^9 = 28160x^2$$

28160

3. Find the coefficient of x^3 in the expansion of $(2-x)^5$.

$$-10(2)^2(x)^3 = -40x^3$$

-40

4. Find the coefficient of x^5 in the expansion of $(3x-2)^8$.

$$-56(3x)^5(2)^3 = -108864x^5$$

-108864

5. Determine the constant term in the expansion of $(x - \frac{2}{x^2})^9$.

$$-84(x)^6(\frac{2}{x^2})^3 = -672$$

-672

6. Find the coefficient of a^5b^7 in the expansion of $(a+b)^{12}$.

$$792a^5b^7$$

792

7. Find the term containing x^{10} in the expansion of $(5+2x^2)^7$.

$$21(5)^2(2x^2)^5$$

$$21(25)(32x^{10})$$

$$16800x^{10}$$

16800

8. (a) Expand $\left(e + \frac{1}{e}\right)^4$ in terms of e .

$$\begin{array}{r} 1 (e)^4 \\ 4 (e)^3 (\frac{1}{e}) \\ 6 (e)^2 (\frac{1}{e})^2 \\ 4 (e) (\frac{1}{e})^3 \\ 1 (\frac{1}{e})^4 \end{array} = e^4 + 4e^2 + 6 + \frac{4}{e^2} + \frac{1}{e^4}$$

(b) Express $\left(e + \frac{1}{e}\right)^4 + \left(e - \frac{1}{e}\right)^4$ as the sum of three terms.

$$e^4 + \cancel{4e^2} + 6 + \frac{4}{e^2} + \frac{1}{e^4} + e^4 - \cancel{4e^2} + 6 - \frac{4}{e^2} + \frac{1}{e^4}$$

$$2e^4 + 12 + \frac{2}{e^4}$$

9. Given that $(3 + \sqrt{7})^3 = p + q\sqrt{7}$ where p and q are integers, find

$$\begin{array}{r} 1 (3)^3 \\ 3 (3)^2 (\sqrt{7}) \\ 3 (3) (\sqrt{7})^2 \\ 1 (\sqrt{7})^3 \end{array} = 27 + 27\sqrt{7} + 63 + 7\sqrt{7}$$

$$= 90 + 34\sqrt{7}$$

(a) $p = 90$

(b) $q = 34$

10. (a) Expand $(x - 2)^4$ and simplify your result.

$$\begin{array}{r} 1 (x)^4 \\ -4 (x)^3 (2) \\ 6 (x)^2 (2)^2 \\ -4 (x) (2)^3 \\ 1 (2)^4 \end{array} = x^4 - 8x^3 + 24x^2 - 32x + 16$$

(b) Find the term in x^3 in $(3x + 4)(x - 2)^4$.

$$(3x + 4)(x^4 - 8x^3 + 24x^2 - 32x + 16)$$

	x^4	$-8x^3$	$24x^2$	$-32x$	16
$3x$			$72x^3$		
4		$+32x^3$			

$40x^3$