

1. Expand  $(x - 2)(2x + 1)^3$ .
2. Expand  $\left(\frac{a}{2} + 1\right)(2a + 1)^4$ .
3. Expand  $(x^2 + 1)\left(x - \frac{1}{x}\right)^4$ .
4. Find the first three terms in the expansion of  $(x - 1)^7(x + 2)^9$ .
5. Find the first three terms in the expansion of  $(1 - a^2)^5(1 + a^2)^{10}$ .
6. Find the first three terms in the expansion of  $(x^2 - 1)^7(x^2 + 1)^8$ .
7. In the expansion of  $(x^2 - 1)^6(x + 2)^9$ , find the term containing  $x^5$ .
8. In the expansion of  $(x^2 - 1)^5(1 + x)^8$ , find the term containing  $x$ .
9. In the expansion of  $(a + 1)^7(a - 1)^7$ , find the term containing  $a^8$ .  
[Look for an easier method.]
10. Expand  $(a + b + c)^4$ . Hint: Write  $(a + b + c)$  in the form  $(a + (b + c))$ .
11. Find the coefficient of  $x^5$  in the expansion of  $(1 + 2x - x^2)^4$ .

## Answers

1.  $8x^4 - 4x^3 - 18x^2 - 11x - 2$
2.  $8a^5 + 32a^4 + 44a^3 + 28a^2 + \frac{17}{2}a + 1$
3.  $x^6 - 3x^4 + 2x^2 + 2 - \frac{3}{x^2} + \frac{1}{x^4}$
4.  $x^{16} + 11x^{15} + 39x^{14} + \dots$
5.  $1 + 5a^2 + 5a^4 + \dots$
6.  $x^{30} + x^{28} - 7x^{26} + \dots$
7.  $4320x^5$     8.  $-8x$     9.  $-35a^8$
10.  $a^4 + 4a^3b + 4a^3c + 6a^2b^2 + 12a^2bc + 6a^2c^2$   
 $+ 4ab^3 + 12ab^2c + 12abc^2 + 4ac^3 + b^4$   
 $+ 4b^3c + 6b^2c^2 + 4bc^3 + c^4$
11.  $-8$