1. Expand $(1 + 4x)^9$ in ascending powers of $x$, up to and including the term in $x^3$, simplifying the coefficients. [4]

2. Find the coefficient of $x^2$ in the expansion of each of the following:
   (i) $(2x^2 + 5x - 7)(x^2 - 6x + 4)$, [2]
   (ii) $(2 + 5x)^{10}$. [3]

3. (i) Expand $(2 + 3x)^4$ completely, simplifying the coefficients. [4]
   (ii) Hence find the coefficient of $x^2$ in the expansion of
   $$(1 - \frac{1}{2}x)^2(2 + 3x)^4.$$ [3]

4. (i) Given that the first three terms in the expansion of $(1 - 4x)^6$ are $1 + cx + dx^2$, find the values of the constants $c$ and $d$. [3]
   (ii) Hence find the coefficient of $x^2$ in the expansion of
   $$(2 - 3x - x^2)(1 - 4x)^6.$$ [3]

5. (i) Expand $(2 + 3x)^6$ in ascending powers of $x$ up to and including the term in $x^2$, simplifying the coefficients. [3]
   (ii) Given that the coefficient of $x^2$ in the expansion of
   $$(1 + ax)(2 + 3x)^6$$
   is 2304, find the value of the constant $a$. [3]

6. (i) Find the first four terms in the expansion, in ascending powers of $x$, of
   $$(1 + 3x)^8.$$ [4]
   (ii) Show that, if terms involving $x^4$ and higher powers of $x$ may be ignored,
   $$(1 + 3x)^8 + (1 - 3x)^8 = 2 + 504x^2.$$ [3]
   (iii) Hence find the value of
   $$1.000\,003^8 + 0.999\,997^8$$
correct to 12 decimal places. [2]