

Using Pascal's Triangle

Without using a calculator:

(a) write out the first seven rows of Pascal's triangle.

(b) Hence find the expansions of:

(i) $(1+x)^5$ (ii) $(1+x)^7$

Using your calculator, find:

(a) 5C_3 (b) 8C_0 (c) ${}^{10}C_5$

(d) 6C_1 (e) 9C_9 (f) 7C_4

Using your calculator, find:

(a) The first four terms, in ascending powers of x , in the expansion of $(1+x)^{10}$

(b) The first four terms, in ascending powers of x , in the expansion of $(1+x)^8$

(c) The first three terms, in ascending powers of x , in the expansion of $(1+x)^{13}$

(d) The first three terms, in ascending powers of x , in the expansion of $(1+x)^{16}$

Write down the combination you would use, and its value, for:

(a) The coefficient of the x^4 term in the expansion of $(1+x)^9$

(b) The coefficient of the x^2 term in the expansion of $(1+x)^6$

(c) The coefficient of the x term in the expansion of $(1+x)^{12}$

(d) The coefficient of the x^3 term in the expansion of $(1+x)^{20}$

(a)

$$\begin{array}{ccccccc} & & & & & & 1 \\ & & & & & & 1 \\ & & & & & 1 & 2 & 1 \\ & & & & 1 & 3 & 3 & 1 \\ & & & 1 & 4 & 6 & 4 & 1 \\ & & 1 & 5 & 10 & 10 & 5 & 1 \\ & 1 & 6 & 15 & 20 & 15 & 6 & 1 \\ 1 & 7 & 21 & 35 & 35 & 21 & 7 & 1 \end{array}$$

(b)(i) $1+5x+10x^2+10x^3+5x^4+x^5$
(ii) $1+7x+21x^2+35x^3+35x^4+21x^5+7x^6+x^7$

(a) 10 (b) 1 (c) 252

(d) 6 (e) 1 (f) 35

(a) $1+10x+45x^2+120x^3$

(b) $1+8x+28x^2+56x^3$

(c) $1+13x+78x^2$

(d) $1+16x+120x^2$

(a) ${}^9C_4 = 126$

(b) ${}^6C_2 = 15$

(c) ${}^{12}C_1 = 12$

(d) ${}^{20}C_3 = 1140$