

Maths Rules

Year 1 Solving Binomial Problems

Section A

1. Find the coefficient of x^3 in the binomial expansion of $(3 + 4x)^4$.
2. Find the coefficient of x^{11} in the binomial expansion of $(\frac{1}{2} - 2x)^{15}$.
3. In the binomial expansion of $(4 + px)^5$, the coefficient of x^3 is 4230. Find the value of p .
4. In the binomial expansion of $(qx - 5)^8$, the coefficient of x^3 term is 25 times larger than the coefficient of the x^5 term. Find the value of q .
5. (a) Find the first three terms in the binomial expansion of $(5 - 2x)^7$ in increasing powers of x .
(b) Hence, given that x is small enough such that you can ignore x^3 and subsequent higher powers, show that

$$(2x + 1)(5 - 2x)^7 \approx 78125 - 62500x - 175000x^2$$

Section B

1. Find the coefficient of x^3 in the expansion of $(x - 1)^3 (2x - 3)^5$.
2. In the expansion of $(ax + b)^5$, the coefficient of x^2 is twice the coefficient of x^3 .
Find $a : b$.
3. In the binomial expansion of $(p + qx)^{10}$ the coefficient of x^2 is 1180980 and the coefficient of x^5 is -1959552 .
Find the values of p and q .