Finding a Single Term in the Expansion

Expression	Power of x in term wanted.	Term in expansion
$(a+x)^{10}$	3	
$(2x-1)^{75}$	50	
$(3-x)^{12}$	7	
$(3x+4)^{16}$	3	

Example

The coefficient of x^4 in the expansion of $(1+qx)^{10}$ is 3360. Find the possible value(s) of the constant q.

Test Your Understanding

In the expansion of $(1+ax)^{10}$, where a is a non-zero constant the coefficient of x^3 is double the coefficient of x^2. Find the value of a.

Extension

1. *MAT 2014 1G]* Let n be a positive integer. The coefficient of x^3y^5 in the expansion of $(1+xy+y^2)^n$ equals:

A) n

B) 2^n

C) $\binom{n}{3}\binom{n}{5}$

D) $4\binom{n}{4}$

E) $\binom{n}{8}$

2. [STEP I 2013 Q6] By considering the coefficient of x^r in the series for $(1+x)(1+x)^n$, or otherwise, obtain the following relation between binomial coefficients:

$$\binom{n}{r}+\binom{n}{r-1}=\binom{n+1}{r}$$

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