

## Binomial Expansion



### Example

Find the first 4 terms in the expansion of  $(3x + 1)^{10}$ , in ascending powers of  $x$ .

## Test Your Understanding

Find the first 3 terms in the expansion of  $\left(2 - \frac{1}{3}x\right)^7$ , in ascending powers of  $x$ .

## Extension

1. [AEA 2013 Q1a] In the binomial expansion of  $\left(1 + \frac{12n}{5}x\right)^n$  the coefficients of  $x^2$  and  $x^3$  are equal and non-zero.

Find the possible values of  $n$ .

2. [STEP I 2010 Q5a] By considering the expansion of  $(1 + x)^n$ , where  $n$  is a positive integer, or otherwise, show that:

$$\binom{n}{0} + \binom{n}{1} + \binom{n}{2} + \cdots + \binom{n}{n} = 2^n$$