Binomial Expansion

Example

Find the first 4 terms in the expansion of $\left(3x+1\right)^{10}$, 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 $\left(1+x\right)^{n}$, where $n$ is a positive integer, or otherwise, show that:

$$\left(\begin{matrix}n\\0\end{matrix}\right)+\left(\begin{matrix}n\\1\end{matrix}\right)+\left(\begin{matrix}n\\2\end{matrix}\right)+…+\left(\begin{matrix}n\\n\end{matrix}\right)=2^{n}$$

Exercise 8C Page 164