

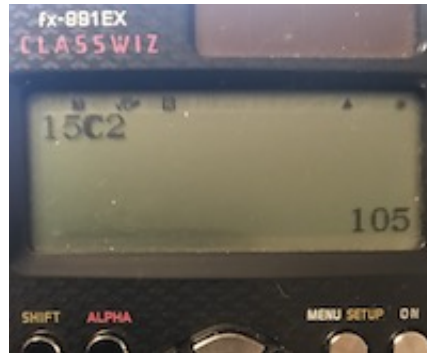
## Lesson 5

**Additional Mathematics**  
**A-Level Pure Mathematics : Year 1**  
**Binomial Expansion**

### 5.1 Homework

Marks Available : 23

#### Question 1



Check that your calculator gives  ${}^{15}C_0 = 1$ ,  ${}^{15}C_1 = 15$  and  ${}^{15}C_2 = 105$

(i) Use your calculator to write down the value of,

$${}^{15}C_3$$

$${}^{15}C_4$$

$${}^{15}C_5$$

[ 3 marks ]

(ii) Hence write out the first six terms of the the expansion of,

$$(1 + x)^{15}$$

[ 2 marks ]

#### Question 2

*A-Level Examination Question from January 2006, P2, Q1(a) (Edexcel)*

Write down the binomial expansion, in ascending powers of  $x$  of  $(1 + 6x)^4$

[ 3 marks ]

**Question 3**

*A-Level Examination Question from January 2008, C2, Q3(a) (Edexcel)*

Find the first 4 terms of the expansion of  $\left(1 + \frac{x}{2}\right)^{10}$  giving each term in its simplest form.

Hint : 
$$\begin{aligned}\left(1 + \frac{x}{2}\right)^{10} &= {}^{10}C_0 \times (1)^{10} \times \left(\frac{x}{2}\right)^0 \\ &+ {}^{10}C_1 \times (1)^9 \times \left(\frac{x}{2}\right)^1 \\ &+ {}^{10}C_2 \times (1)^8 \times \left(\frac{x}{2}\right)^2 \\ &+ {}^{10}C_3 \times (1)^7 \times \left(\frac{x}{2}\right)^3 \\ &+ \dots\end{aligned}$$

[ 4 marks ]

**Question 4**

*A-Level Examination Question from January 2010, C2, Q1 (Edexcel)*

Find the first 3 terms, in ascending powers of  $x$ , of binomial expansion of

$$(3 - x)^6$$

and simplify each term.

[ 4 marks ]

**Question 5**

*A-Level Examination Question from October 2016, C12, Q5 (Edexcel)*

- ( a ) Find the first 4 terms, in ascending powers of  $x$ , of the binomial expansion of,

$$\left( 3 - \frac{ax}{2} \right)^5$$

where  $a$  is a positive constant. Give each term in its simplest form.

[ 4 marks ]

Given that, in the expansion, the coefficient of  $x$  is equal to the coefficient of  $x^3$

- ( b ) find the exact value of  $a$  in its simplest form

[ 3 marks ]

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Teachers may obtain detailed worked solutions to the exercises by email from [mhh@shrewsbury.org.uk](mailto:mhh@shrewsbury.org.uk)