THE GC SCHOOL OF CAREERS

DEPARTMENT OF MATHEMATICS

EXTRA PRACTICE

CORE MATHEMATICS 2

THE BINOMIAL EXPANSION

EXERCISES

1. Find the complete binomial expansion of $(1-2x)^4$ in ascending powers of x, giving each coefficient as simply as possible.

2. Find the first 4 terms of the expansion, in ascending powers of x, of $(2+3x)^9$, giving each coefficient as simply as possible.

3. Find the first 4 terms of the expansion, in ascending powers of x, of $(2+x)(1-x)^5$, giving each coefficient as simply as possible.

4. In the expansion of $(2+px)^7$, the coefficient of x^2 is 6048. Work out the possible values of p.

5. In the expansion of $(1+px)^5$, where $p \neq 0$, the coefficient of x^3 is twice the coefficient of x^2. Find the possible values of p.

6. In the expansion of $(1+px)^{12}$, the coefficient of x is $2q$, and the coefficient of x^2 is $55q$. Given that $p \neq 0$, find the values of p and q.

7. Given that $\binom{a}{5} = \frac{7!}{5!b!} = c$, write down the values of a, b and c.

8. **a)** Find the expansion of $(2-3x)^7$ in ascending powers of x up to the x^3 term, giving each coefficient as simply as possible.

b) Using your expansion from part **a)**, find an approximation for 1.94^7, stating clearly the substitution you have made.

9. **a)** Write down the first 4 terms in the binomial expansion, in ascending powers of *x*, of $(1+ax)^n, n>2$.

Given that in this expansion, the coefficient of *x* is 8 and the coefficient of x^2 is 30,

b) calculate the value of *n* and the value of *a*,

c) find the coefficient of x^3.

10. The first three terms in the expansion, in ascending powers of *x*, of $(1+px)^n$, are $1-18x+36p^2x^2$.

Given than *n* is a positive integer, find the value of *n* and the value of *p*.

11. **a)** Write down the first four terms of the binomial expansion, in ascending powers of *x*, of $(1+3x)^n$, where $n>2$.

Given that the coefficient of x^3 in this expansion is ten times the coefficient of x^2,

b) find the value of *n*,

c) find the coefficient of x^4 in the expansion.

12. The expansion of $(2-px)^6$ in ascending powers of *x*, as far as the term in x^2, is

$$64+Ax+135x^2$$

Given that $p>0$, find the value of *p* and the value of *A*.