Advanced Higher Homework Exercises June 2015

Binomial Theorem

1. Expand $(p+2q)^6$

2. Expand $(2u-3c)^5$

3. Find the constant term in the expansion of $\left(x+\frac{2}{x}\right)^8$

4. Write down and simplify the general term in the expansion of $\left(x^2+\frac{1}{x}\right)^{10}$.

Hence or otherwise, obtain the term in x^{14}.

5. Use the binomial theorem to evaluate $(0.96)^6$ correct to 4 significant figures.

6. Prove that for all k ≥ 3, $\binom{k+2}{3}-\binom{k}{3}=k^2$.