Binomial Theorem

- 1) Using binomial theorem, expand each of the following;
 - $(1+x)^5$

 - ii) $(2x + y)^6$ iii) $(x \frac{1}{y})^5$
 - $(x^2 \frac{2}{x})^4$ iv)
- 2) Evaluate:
 - $(\sqrt{2}+1)^5-(\sqrt{2}-1)^5$
 - ii) $(2+\sqrt{3})^7+(2-\sqrt{3})^7$
- 3) Find the middle term in the expansion of $(3x \frac{x^3}{6})^7$.
- 4) Find the term independent of x in the expansion of $\left(x^2 + \frac{2}{x}\right)^{15}$
- 5) Which is larger, $(1.01)^{100000}$ or 10000?
- 6) Find a if the 17th and 18th terms of $(2 + a)^{50}$ are equal.
- 7) Find the coefficient of x^6y^3 in the expansion of $(x + 2y)^9$.

Bonus:

- 8) The second, third and fourth terms in the binomial expansion of $(x + a)^n$ are 240, 720 and 1080. Find x, a and n.
- 9) Expand using binomial theorem $(1 + \frac{x}{2} \frac{2}{x})^4$, with $x \neq 0$.