8.4) Solving binomial problems

Worked example	Your turn
Find the coefficient of x^6 in the binomial expansion of $(3 + 2x)^{10}$	Find the coefficient of x^4 in the binomial expansion of $(2 + 3x)^{10}$ 1088640

Worked example	Your turn
Find the coefficient of x^3 in the binomial expansion of $(3+x)(2-3x)^7$	Find the coefficient of x^3 in the binomial expansion of $(2+x)(3-2x)^7$ -24948

Worked example	Your turn
The coefficient of x^6 in the expansion of $(1+qx)^{10}$ is 153090. Find the possible value(s) of the constant q.	The coefficient of x^4 in the expansion of $(1+qx)^{10}$ is 3360. Find the possible value(s) of the constant q. $q = \pm 2$

Worked example

In the expansion of $(1 + ax)^8$, where a is a non-zero constant the coefficient of x^3 is quadruple the coefficient of x^2.
Find the value of a.

Your turn

In the expansion of $(1 + ax)^{10}$, where a is a non-zero constant the coefficient of x^3 is double the coefficient of x^2.
Find the value of a.

$$a = \frac{3}{4}$$

Worked example	Your turn
Given that, in the expansion of $(1+qx)^8$, the coefficient of x is $-r$ and the coefficient of x^2 is $14r$, find the value of q and the value of r	Given that, in the expansion of $(1+qx)^8$, the coefficient of x is $-r$ and the coefficient of x^2 is $7r$, find the value of q and the value of r $q=-2, r=16$

Worked example	Your turn
In the binomial expansion of $(1+x)^{40}$, the coefficients of x^{19} and x^{20} are p and q respectively. Find the value of $\frac{q}{p}$	In the binomial expansion of $(1+x)^{20}$, the coefficients of x^{9} and x^{11} are p and q respectively. Find the value of $\frac{q}{p}$ 1