

1. When $(1 + ax)^n$ is expanded as a series in ascending powers of x , the coefficients of x and x^2 are -6 and 27 respectively.
- (a) Find the value of a and the value of n . (5)
- (b) Find the coefficient of x^3 . (2)
- (c) State the set of values of x for which the expansion is valid. (1)
- (Total 8 marks)**

1. (a) $na = -6$ $\frac{n(n-1)}{2}a^2 = 27$ B1, B1
- Attempts solution by eliminating variable e.g. $\frac{n(n-1)36}{n^2} = 54$
- or $-\frac{6}{a}(-\frac{6}{a}-1)a^2 = 54$ M1
- $n = -2, a = 3$ A1, A1 5
- (b) $\frac{(-2)(-3)(-4)3^3}{6} = -108$ M1 A1 2
- for M1 allow a instead of a³*
- (c) $|x| < \frac{1}{3}$ or $-\frac{1}{3} < x < \frac{1}{3}$ B1 f.t. 1
- f.t. on $\frac{1}{a}$*

[8]

1. The methods for finding binomial coefficients were well known and most candidates answered this question well. The most common errors were to include a rather than a^2 in the coefficient of x^2 . There was some confusion about whether to include the power of x in the coefficient, but some followed earlier erroneous statements by a recovery later. Part (c) proved to be a discriminator with many candidates not attempting to give the range of validity.