Question Number	Scheme	Marks
1. (a)	$(3+kx)^7 = 3^7 + {}^7C_1 3^6 (kx)^1 + {}^7C_2 3^5 (kx)^2 + {}^7C_3 3^4 (kx)^3 + \ldots$ $= 2187 + 5103kx + 5103k^2x^2 + 2835k^3x^3 + \ldots$	B1, M1 A1, A1 **(4)**
(b)	Sets $5103k^2 = 3 \times 2835k^3 \Rightarrow k = \ldots$ $k = \frac{3}{5}$	M1 A1 **(2)** **(6 marks)**

(a)

B1: For a first term (constant term) of 3^7 or 2187 or even ${}^7C_0 \times 3^7$

M1: For an attempt at the binomial expansion. Score for a correct attempt at one of terms 2, 3 or 4

Accept sight of ${}^7C_1 3^6 (kx)^1$ or ${}^7C_2 3^5 (kx)^2$ or ${}^7C_3 3^4 (kx)^3$ condoning the Omission of brackets.

Accept any **correct** coefficient appearing from Pascal's triangle.

A1: For any two simplified terms of $2187 + 5103kx + 5103k^2x^2 + 2835k^3x^3$

A1: For $2187 + 5103kx + 5103k^2x^2 + 2835k^3x^3$ ignoring terms with greater powers. Allow as a list and allow in descending order.

ALT For the first two marks

B1: Takes 3^7 out as a common factor to obtain $3^7\left(1+\frac{kx}{3}\right)^7$

M1: For an attempt at the binomial expansion Score for a correct attempt at one of terms 2, 3 or 4 inside the main bracket.

Accept $\ldots\left(1+(7\times)\left(\frac{kx}{3}\right), \left(\frac{7\times6}{2!}\right)\times\left(\frac{kx}{3}\right)^2, \left(\frac{7\times6\times5}{3!}\right)\times\left(\frac{kx}{3}\right)^3\right)$ condoning the omission of brackets

(b)

M1: For setting $'5103'k^2 = 3\times'2835'k^3$ leading to $k =$ …following **correct** processing M0 if they include x's, but allow if recovered

A1: For $k = \frac{3}{5}$ or exact equivalent. No other values stated.