

3 In this question you should assume that $-1 < x < 1$.

(a) For the binomial expansion of $(1-x)^{-2}$

(i) find and simplify the first four terms, **[2]**

(ii) write down the term in x^n . **[1]**

(b) Write down the sum to infinity of the series $1 + x + x^2 + x^3 + \dots$. **[1]**

(c) Hence or otherwise find and simplify an expression for $2 + 3x + 4x^2 + 5x^3 + \dots$ in the form $\frac{a-x}{(b-x)^2}$ where a and b are constants to be determined. **[3]**