

9 (a) The expression

$$\frac{x+3}{(1-3x)(1-x)}$$

can be written in the form

$$\frac{A}{1-3x} + \frac{B}{1-x}$$

where A and B are constants.

Find the value of A and the value of B

[2 marks]

9 (b) (i) Find the first three terms of the binomial expansion of

$$(1-x)^{-1}$$

[2 marks]

9 (b) (ii) Hence or otherwise, write down the first three terms of the binomial expansion of

$$\frac{1}{1-3x}$$

[1 mark]

9 (c) (i) Find the first three terms of the binomial expansion of

$$\frac{x+3}{(1-3x)(1-x)}$$

[2 marks]

9 (c) (ii) State the range of values of x for which the answer to **(c)(i)** is valid.

[1 mark]