**9** (a) Write  $\frac{3}{(3-x)^3}$  in the form  $a(1-bx)^{-3}$ 

where a and b are fractions in their lowest terms.

(2)

(b) Expand  $\frac{3}{(3-x)^3}$  in ascending powers of x up to and including the term in  $x^3$ 

Express each coefficient as a fraction in its lowest terms.

(3)

- (c) (i) Use a suitable value of x with your expansion in part (b), to obtain an approximation for  $\frac{24}{125}$  to 5 decimal places.
  - (ii) Find the percentage error, to 2 decimal places, of your approximation from the actual value.

(4)

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(Total for Question 9 is 9 marks)

