9 Given that $\frac{1}{(2-x)^3}$ can be written as $p(1-qx)^{-3}$

(a) find the value of p and the value of q.

(2)

(b) Expand $\frac{1}{(2-x)^3}$ in ascending powers of x up to and including the term in x^3 and express each coefficient as an exact fraction in its lowest terms.

(3)

$$f(x) = \frac{a+bx}{(2-x)^3} \text{ where } a \text{ and } b \text{ are integers}$$

The first three terms of the expansion of $f(x)$ are $\frac{3}{8} - \frac{43}{16}x + cx^2$

(c) Find the value of a and the value of b.

(3)

(d) Find the exact value of c.

(2)

Question 9 continued

Question 9 continued

Question 9 continued

(Total for Question 9 is 10 marks)