9 (a) Expand $\left(1-\frac{3x}{4}\right)^{\frac{1}{3}}$ in ascending powers of x up to and including the term in x^3, simplifying your terms as far as possible.

(3)

(b) Expand $\left(1+\frac{3x}{4}\right)^{-\frac{1}{3}}$ in ascending powers of x up to and including the term in x^3, simplifying your terms as far as possible.

(3)

(c) Write down the range of values of x for which both of your expansions are valid.

(1)

(d) Expand $\left(\frac{4-3x}{4+3x}\right)^{\frac{1}{3}}$ in ascending powers of x up to and including the term in x^3, simplifying your terms as far as possible.

(3)

(e) Hence obtain an estimate, to 3 significant figures, of

$$\int_0^{0.5}\left(\frac{4-3x}{4+3x}\right)^{\frac{1}{3}}\mathrm{d}x$$

(4)

Question 9 continued

Question 9 continued

Question 9 continued

(Total for Question 9 is 14 marks)