7 (a) Expand $\left(1+\frac{2x}{5}\right)^{\frac{1}{2}}$ in ascending powers of x up to and including the term in x^3, giving each coefficient as an exact fraction in its lowest terms.

(3)

(b) Expand $\left(1-\frac{2x}{5}\right)^{-\frac{1}{2}}$ in ascending powers of x up to and including the term in x^3, giving each coefficient as an exact fraction in its lowest terms.

(3)

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

(1)

(d) Expand $\left(\frac{5+2x}{5-2x}\right)^{\frac{1}{2}}$ in ascending powers of x up to and including the term in x^2, giving each coefficient as an exact fraction in its lowest terms.

(3)

(e) Hence use algebraic integration to obtain an estimate of

$$\int_{0.1}^{0.3}\left(\frac{5+2x}{5-2x}\right)^{\frac{1}{2}}\mathrm{d}x$$

Give your answer to 4 significant figures.

(4)

Question 7 continued

Question 7 continued

Question 7 continued

(Total for Question 7 is 14 marks)