10 (a) Expand $(1 - 2x)^{-\frac{1}{2}}$ in ascending powers of x up to and including the term in x^3, simplifying each term as far as possible.

(3)

(b) Write down the range of values of x for which your expansion is valid.

(1)

$$f(x) = \frac{2 - x^2}{\sqrt{(1 - 2x)}}$$

(c) Find the series expansion of $f(x)$ in ascending powers of x up to and including the term in x^3, simplifying each term as far as possible.

(3)

The region R is bounded by the curve with equation $y = f(x)$, the positive x-axis, the positive y-axis and the line with equation $x = 0.2$

(d) Using your expansion of $f(x)$ and algebraic integration, find an estimate for the area of R, giving your answer to 4 decimal places.

(4)

Question 10 continued

Question 10 continued

(Total for Question 10 is 11 marks)

TOTAL FOR PAPER IS 100 MARKS