11 $f(x) = 10 + 6x - x^2$

Given that $f(x)$ can be written in the form $A(x + B)^2 + C$ where A, B and C are constants,

(a) find the value of A, the value of B and the value of C

(4)

(b) Hence, or otherwise, find

(i) the value of x for which $f(x)$ has its greatest value

(ii) the greatest value of $f(x)$

(2)

The curve C has equation $y = f(x)$

The curve S with equation $y = x^2 - x + 13$ intersects curve C at two points.

(c) Find the x coordinate of each of these two points.

(3)

(d) Use algebraic integration to find the exact area of the finite region bounded by the curve C and the curve S.

(5)

Question 11 continued

Question 11 continued

(Total for Question 11 is 14 marks)

TOTAL FOR PAPER IS 100 MARKS