8 $f'(x) = 18x^2 - 2x + 13$

Given that $(2x - 1)$ is a factor of $f(x)$

show that the curve with equation $y = f(x)$ has only one intersection with the x-axis.

(9)

Question 8 continued

(Total for Question 8 is 9 marks)

9 (a) Using the formulae on page 2, show that

(i) $\cos^2 A = \dfrac{\cos 2A + 1}{2}$

(ii) $\sin^2 A = \dfrac{1 - \cos 2A}{2}$

(4)

(b) Show that

$$(2\sin x - \cos x)(\sin x - 3\cos x) = \frac{1}{2}(\cos 2x - 7\sin 2x + 5)$$

(5)

$$y = (2\sin x - \cos x)(\sin x - 3\cos x)$$

(c) Solve, for $0° \leqslant x \leqslant 180°$ the equation, $\dfrac{dy}{dx} = 0$

Give your answers to the nearest whole number.

(4)

Question 9 continued

Question 9 continued

Question 9 continued

(Total for Question 9 is 13 marks)