$\sin(A+B) = \sin A \cos B + \cos A \sin B$

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

Using the above identities

(a) show that $\cos 2\theta = 2 \cos^2 \theta - 1$

(3)

(b) find a simplified expression for $\sin 2\theta$ in terms of $\sin \theta$ and $\cos \theta$

(1)

(c) show that $\cos 3\theta = 4 \cos^3 \theta - 3 \cos \theta$

(4)

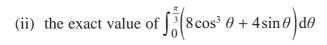
Hence, or otherwise,

(d) solve, for $0 \leqslant \theta < \pi$ giving your answers in terms of π , the equation

$$6\cos\theta - 8\cos^3\theta + 1 = 0$$

(4)

- (e) find
 - (i) $\int \left(8\cos^3\theta + 4\sin\theta \right) d\theta$





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	(Total for Question 9 is 16 marks)

