Topic 3: Geometry and Trigonometry	Trig Equations

(a) Show that $2\sin^2 x + 3\cos x = 0$ can be written as
$2\cos^2 x - 3\cos x - 2 = 0$.

[1 mark]

(b) Hence or otherwise, solve $2\sin^2 x + 3\cos x = 0$ for $0 \le x < 2\pi$.

[5 marks]

Mark scheme:

(a) Correct substitution of $\sin^2 x = 1 - \cos^2 x$ A1

$2(1 - \cos^2 x) + 3\cos x = 0$

$2\cos^2 x - 3\cos x - 2 = 0$ AG

[1 mark]

(b) Attempting to factor   M1

$(2\cos x + 1)(\cos x - 2)$ A1

OR

Attempting to use the quadratic formula   M1

$\cos x = \dfrac{3 \pm \sqrt{3^2 - 4\times 2\times(-2)}}{2(2)} \left(= \dfrac{3\pm 5}{4}\right)$ A1

Then

$\cos x = -\dfrac{1}{2}$ A1

$x = \dfrac{2\pi}{3}, \dfrac{4\pi}{3}$ A1 A1

[5 marks]