2014 15a Find all solutions of $2\sin^2 x + \cos x - 2 = 0$, where $0 \leq x \leq 2\pi$. **3**

$$2\sin^2 x + \cos x - 2 = 0$$
$$2(1 - \cos^2 x) + \cos x - 2 = 0$$
$$2 - 2\cos^2 x + \cos x - 2 = 0$$
$$2\cos^2 x - \cos x = 0$$
$$\cos x (2\cos x - 1) = 0$$
$$\cos x = 0 \qquad \cos x = \frac{1}{2}$$
$$\therefore\ x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{3}, \frac{5\pi}{3}$$

State Mean: **1.25**

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by BOSTES.

Board of Studies: Notes from the Marking Centre

Many candidates had difficulty with this part.

Common problems were:

- not recognising or incorrectly using the substitution $\sin^2 x + \cos^2 x = 1$;
- dividing both sides of their equation by $\cos x$;
- incorrectly factorising the trigonometric quadratic expression;
- expressing answers in degrees rather than radians.

http://www.boardofstudies.nsw.edu.au/hsc_exams/2014/pdf_doc/2014-maths.pdf