2014 14b The roots of the quadratic equation $2x^2 + 8x + k = 0$ are α and β.

(i) Find the value of $\alpha + \beta$. **1**

(ii) Given that $\alpha^2\beta + \alpha\beta^2 = 6$, find the value of k. **2**

(i) $\alpha + \beta = \frac{-b}{a}$

$= \frac{-8}{2}$

$= -4$

(ii) $\alpha\beta = \frac{c}{a}$

$= \frac{k}{2}$

$\alpha^2\beta + \alpha\beta^2 = \alpha\beta(\alpha + \beta)$

$= \frac{k}{2}(-4)$

$= -2k$

$-2k = 6$

$k = -3$

State Mean:
0.85
1.41

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

Board of Studies: Notes from the Marking Centre

(i) Most candidates stated the correct value.

A common problem was:

- using $\alpha + \beta = \frac{b}{a}$

(ii) Most candidates realised the need to find a value for $\alpha\beta$ and attempted to factorise and combine (b)(i).

A common problem was:

- after correctly factorising, and finding correct values for $\alpha\beta$ and $\alpha + \beta$, many candidates made errors solving the resulting equation.

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