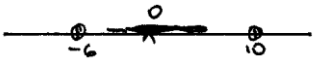
06	**7c**	(i) (ii)	Write down the discriminant of $2x^2 + (k - 2)x + 8$, where k is a constant. Hence, or otherwise, find the values of k for which the parabola $y = 2x^2 + kx + 9$ does not intersect the line $y = 2x + 1$.	**1** **2**

i. $\Delta = b^2 - 4ac$
$= (k - 2)^2 - 4(2)(8)$
$= k^2 - 4k + 4 - 64$
$= k^2 - 4k - 60$

ii. If no intersection, then $\Delta < 0$.
$k^2 - 4k - 60 < 0$
$(k - 10)(k + 6) < 0$
$-6 < k < 10$



* These solutions have been provided by *projectmaths* and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

(i) This provided the easiest mark of the question, with candidates required simply to write down the discriminant from the given quadratic equation.

(ii) This was perhaps the most challenging part of the question, since it was left to candidates to see a connection between a value of an unknown in the coefficient of a term of the quadratic equation and the intersection of a parabola with a given line. Responses seldom linked this with the discriminant.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/