The Discriminant Exam Questions (from OCR 4721)

Q1, (Specimen Q3)

The quadratic equation $x^2 + kx + k = 0$ has no real roots for x.

(i) Write down the discriminant of $x^2 + kx + k$ in terms of k. [2]

(ii) Hence find the set of values that k can take. [4]

Q2, (Jun 2007, Q4)

(i) Find the discriminant of $kx^2 - 4x + k$ in terms of k. [2]

(ii) The quadratic equation $kx^2 - 4x + k = 0$ has equal roots. Find the possible values of k. [3]

Q3, (Jan 2010, Q10)

The quadratic equation $kx^2 - 30x + 25k = 0$ has equal roots. Find the possible values of k. [4]

Q4 (Jan 2013, Q10)

The quadratic equation $kx^2 + (3k - 1)x - 4 = 0$ has no real roots. Find the set of possible values of k. [7]

Q5, (Jun 2015, Q8)

(i) Sketch the curve $y = 2x^2 - x - 3$, giving the coordinates of all points of intersection with the axes. [4]

(ii) Hence, or otherwise, solve the inequality $2x^2 - x - 3 > 0$. [2]

(iii) Given that the equation $2x^2 - x - 3 = k$ has no real roots, find the set of possible values of the constant k. [3]

Q6, (Jun 2016, Q9)

Find the set of values of k for which the equation $x^2 + 2x + 11 = k(2x - 1)$ has two distinct real roots. [7]