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A LEVEL MATHS

(10) The Discriminant for Quadratic Equations

WORKING AT D/E

(1) Complete the sentence:
"If $b^2 - 4ac < 0$ then there are…

(2) State the number of real roots to the equation $x^2 + 6x + 5 = 0$ by considering the discriminant.

(3) Sketch the graph of a quadratic equation that has a discriminant of 0.

WORKING AT B/C

(1) The equation $x^2 + kx + 16 = 0$ has a repeated real root. Find the two possible values of k.

(2) The quadratic equation $6x^2 + 4kx + 5 = 0$, $k < 0$ has a discriminant of -56. Find the value of k.

(3) The quadratic equation $kx^2 + 5kx = 3$ has no real roots. Find the set of values that satisfy k.

WORKING AT A*/A

(1) The graphs of $y = 3$ and $y = x^2 + kx + 10$ do not intersect. Show that $-2\sqrt{7} < k < 2\sqrt{7}$

(2) The equation $4kx^2 + 4kx + 4 = 0$, $k \neq 0$ has a repeated root. Find the numeric value of this root.

(3) The diagram below shows part of the graph of $y = x^2 + px + q$. The points $(0, -1)$ and $(3, -10)$ lie on the curve. Find the value of the discriminant for $x^2 + px + q = 0$.