

A-Level Maths - Core Algebra Practice Questions

1. Solve the simultaneous equations

$$y - 2x - 4 = 0$$

$$4x^2 + y^2 + 20x = 0$$

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2. Find the set of values of x for which

(a) $4x - 5 > 15 - x$

(b) $x(x - 4) > 12$

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3. (i) Find the coordinates of the points of intersection of the curve $y = 2x^2 - 5x - 3$ with the axes.

(ii) Find the coordinates of the points of intersection of the curve $y = 2x^2 - 5x - 3$ and the line $y = x + 3$.

(iii) Find the set of values of k for which the line $y = x + k$ does not intersect the curve $y = 2x^2 - 5x - 3$.

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4. The equation $(p - 1)x^2 + 4x + (p - 5) = 0$, where p is a constant, has no real roots.

(a) Show that p satisfies $p^2 - 6p + 1 > 0$

(b) Hence find the set of possible values of p .

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5. (i) Find the set of values of k for which the line $y = 2x + k$ intersects the curve $y = 3x^2 + 12x + 13$ at two distinct points.

(ii) Express $3x^2 + 12x + 13$ in the form $a(x + b)^2 + c$. Hence show that the curve $y = 3x^2 + 12x + 13$ lies completely above the x -axis.

(iii) Find the value of k for which the line $y = 2x + k$ passes through the minimum point of the curve $y = 3x^2 + 12x + 13$.

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