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A LEVEL MATHS

(38) An Introduction to Mathematical Proof

WORKING AT D/E

(1) Prove that

$(x-3)(2x+1)^2 \equiv 4x^3 - 8x^2 - 11x - 3$

(2) $f(x) = x^2 + 2x + 6$

Prove that $f(x)$ is always positive for all real values of x

(3) Prove that $\frac{x}{2+\sqrt{3}} \equiv x(2-\sqrt{3})$

WORKING AT B/C

(1) The triangle ABC has coordinates A (6,8), B (2,4) and C (3,3)

Prove that $< ABC$ is a right angle.

(2) $f(x) = x^2 + 4x + c$ where c is a constant.

Prove that the minimum point on the graph of $y = f(x)$ has coordinates $(-2, c-4)$

WORKING AT A*/A

(1) Prove that, if $y = 3x + c$ where c is a constant, is a chord to the circle with $x^2 + y^2 = 36$ then c must satisfy the inequality $-6\sqrt{10} < c < 6\sqrt{10}$.

(2) In the triangle ABC, $< ABC = x^o$

The coordinates of A, B and C are (a, b), (c, d) and (e, d) respectively.

Prove that if $x = 90$ then $a = c$.