SEQUENCES & SERIES (Q 4 & 5, PAPER 1)

LESSON NO. 5: SEQUENCE INEQUALITIES

2005

4 (c) (i) Show that $\dfrac{a+b}{2} \leq \sqrt{\dfrac{a^2+b^2}{2}}$, where a and b are real numbers.

(ii) The lengths of the sides of a right-angled triangle are a, b and c, where c is the length of the hypotenuse. Using the result from part (**i**), or otherwise, show that $a+b \leq c\sqrt{2}$.

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4 (c) (ii) p, q and r are three numbers in arithmetic sequence. Prove that $p^2 + r^2 \geq 2q^2$.

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4 (c) (ii) a, b, c, d are the first, second, third and fourth terms of a geometric sequence, respectively. Prove that $a^2 - b^2 - c^2 + d^2 \geq 0$.