Austria Beginners' Competition 2002

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1 We calculate the sum of 7 natural consecutive pairs (e.g. $2+4+6+8+10+12+14$) and we will call the result A, then the sum of the next 7 consecutive pairs (in the example, $16+18+...$) and its result we will call B, and finally we calculate the sum of the following 7 consecutive pairs and its result we will call C. Can the product ABC be 2002^3?

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2 Prove that there are no $x \in \mathbb{R}^+$ such that

$$x^{\lfloor x \rfloor} = \frac{9}{2}.$$

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3 Find all real numbers x that satisfy the following inequality $|x^2-4x+1| > |x^2-4x+5|$

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4 In a trapezoid $ABCD$ with base AB let E be the midpoint of side AD. Suppose further that $2CD = EC = BC = b$. Let $\angle ECB = 120^\circ$. Construct the trapezoid and determine its area based on b.
