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by parmenides51

1 In the figure, triangle ADE is produced from triangle ABC by a rotation by 90^o about the point A. If angle D is 60^o and angle E is 40^o, how large is then angle u?
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2 Solve the system of equations

$$\begin{cases} \dfrac{1}{x+y} + x = 3 \\ \dfrac{x}{x+y} = 2 \end{cases}$$

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3 Georg has bought lots of filled chocolates for a party, and when he counts how many he has, he discovers that the number is a prime number. He distributes so many of the chocolates as possible on 60 trays with an equal number on each. He notes then that he has more than one piece left and that the number left pieces is not a prime number. How many pieces of chocolate does Georg have left?

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4 Let E be an arbitrary point different from A and B on the side AB of a square $ABCD$, and let F and G be points on the segment CE so that BF and DG are perpendicular to CE. Prove that $DF = AG$.

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5 Imagine a square scheme consisting of $n \times n$ fields with edge length 1, where n is an arbitrary positive integer. What is the maximum possible length of a route you can follow along the edges of the fields from point A in the lower left corner to point B in the upper right corner if you must never return to one point where you have been before? (The figure shows for $n = 5$ an example of a permitted route and an example of a not permitted route).
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