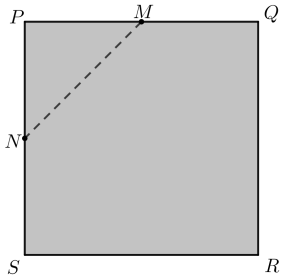
Problem of the Week

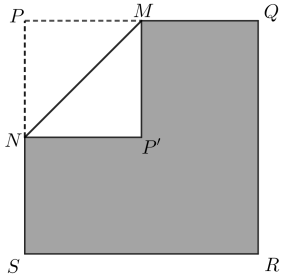
Problem D

From Square to Hexagon

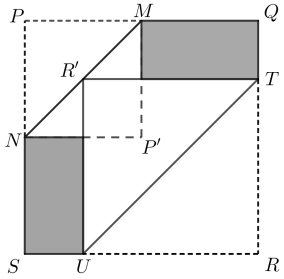
A square piece of paper, $PQRS$, has side length 40 cm. The page is grey on one side and white on the other side. Point M is the midpoint of side PQ and point N is the midpoint of side PS.



The paper is folded along MN so that P touches the paper at the point P'.



Point T lies on QR and point U lies on SR such that TU is parallel to MN, and when the paper is folded along TU, the point R touches the paper at the point R' on MN.



What is the area of hexagon $NMQTUS$?

Here are some known properties of the diagonals of a square that may be useful:

- the diagonals are equal in length; and
- the diagonals right bisect each other; and
- the diagonals bisect the corner angles.