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.