Problem of the Week
Problem D
Fold Carefully

A square piece of paper $ABCD$ has side length 20 cm. The page is grey on one side and white on the other. Point M is the midpoint of side AB and point N is the midpoint of side AD. (Refer to the top diagram.)

The paper is folded along MN so that A touches the paper. (Refer to the second diagram.)

Point C is then folded over a line PQ parallel to MN so that C lies on MN. (Refer to the third and bottom diagram.)

What is the area of hexagon $NMBPQD$?

A square is a four sided figure with sides of equal length and corner angles each measuring 90°. Here are some known properties of the diagonals of squares:

- the diagonals are equal length; and

- the diagonals right bisect each other; and

- the diagonals bisect the corner angles.