Folding

Question 1

A square sheet of paper is folded *once* along a straight line.

For each of the following shapes, either show how to make it, or prove that it cannot be made:

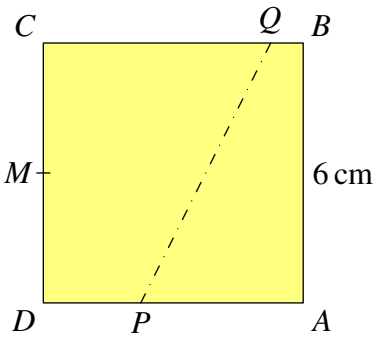
(a) a rectangle that is not a square;
(b) an isosceles triangle;
(c) a right-angled triangle;
(d) a rhombus that is not a square.

Question 2

The diagram shows a square sheet of paper $ABCD$ with sides of length 6 cm. The point M is the midpoint of side CD.

The paper is folded along PQ, where P lies on DA and Q lies on BC, so that the vertex A folds to the point M.

What is the length of PQ?



Question 3

The square sheet of paper S has sides of length 2.

Explain how to fold S along straight lines to make a line segment of length $\sqrt{3}$.