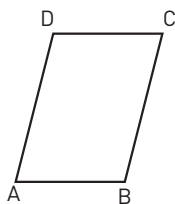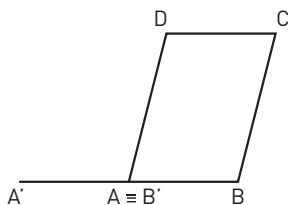> **YOU & MATHS** **Translation of a side** Given the parallelogram $ABCD$, apply to the segment AB the translation along the vector $\overrightarrow{CD}$. Prove that $A'ACD$ is a parallelogram, too.

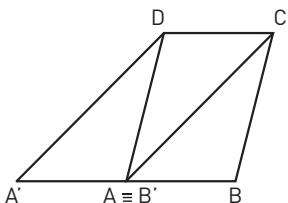Let us draw a parallelogram $ABCD$.

Let us translate the line segment AB along the vector $\overrightarrow{CD}$ and let A' and B' be the endpoints of the translated line segment.

Notice that B' and A coincide.
Let us draw the quadrilateral $A'ACD$.

We can notice that $A'ACD$ is a parallelogram because it has one pair of opposite sides that are parallel and congruent; in fact:

- $A'A \mathbin{/\mkern-5mu/} CD$ by construction;
- since $ABCD$ is a parallelogram, $CD \cong AB$; moreover, $A'B' \cong AB$ by construction and A and B' coincide, so $CD \cong A'A$.