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## Symmetries of a square.

## Basic operations.

Rotation, written R, which rotates clockwise by 90°,

$$\operatorname{turning} \begin{array}{|c|c|c|c|}\hline \mathsf{FRONT} \\ & \uparrow & \operatorname{into} \end{array} \longrightarrow \begin{array}{|c|c|c|c|c|}\hline \mathsf{FRONT} \\ & \downarrow \\ &$$

X-Flipping, written X, which flips across a horizontal line,

Y-Flipping, written Y, which flips across a vertical line,

t	FRONT	into	BACK
turning		into	$\uparrow$

Nothing, written N, which does nothing,

$$\operatorname{turning} \left[ \begin{array}{c} \mathsf{FRONT} \\ \uparrow \end{array} \right] \operatorname{into} \left[$$

## Useful facts.

Name: