Sample question from ACEPhysics activity:

A. Compute $XZ$ and $ZX$ using matrices.

Do this on scrap paper.

Does the order matter?

Yes, order matters  No, $XZ = ZX$

In general, order of matrix multiplication matters. However, if it happens that $AB = BA$, then the operators $A$ and $B$ are said to commute. (So above, we saw that $X$ and $Z$ do not commute.)

B. Does $Z$ commute with itself?

Yes  No

Link to activity: https://acephysics.net/tutorials/quantum-circuit-diagrams