Step-1

Suppose T is a reflection across the $45°$ line and S is a reflection across the y-axis.

And the domain **V** is the x-y plane.

Let $v=(1,2)$

Then $T(v)=(1,2)$

Now we have to find $S(T(v))$ and $T(S(v))$.

Step-2

Now

$S(T(V))=S(1,2)$

$=(-1,2)$ (because S is reflection acrosss $y-$axis)

$T(S(V))=T(S(2,1))$

$=T(-2,1)$ (because S is reflection across $y-$axis)

$=(1,-2)$ (since T is reflection across $45°$ line)

Therefore $\boxed{ST\neq TS}$