17. Sea $U = I - 2uu^t$ un reflector ortogonal. Sea x tal que $x = v + w$ con v múltiplo de u y w ortogonal a u. Mostrar que $Ux = -v + w$. Interpretar geométricamente en $\mathbb{R}^n$.

$$
\begin{aligned}
Ux &= (I - 2uu^T)(v+w) \\
&= v + w - 2uu^T(v+w) \\
&= v + w - 2uu^Tv - 2uu^Tw \\
&= v + w - 2uu^Tv \\
&= v + w - 2v \\
&= -v + w
\end{aligned}
$$

$v = \alpha u$

$$
\begin{aligned}
uu^Tv &= uu^T\alpha u \\
&= \alpha uu^Tu \\
&= \alpha u \|u\|_2^2 \qquad \|u\|_2^2 = 1 \\
&= \alpha u \\
&= v
\end{aligned}
$$