$$
\begin{aligned}
PRSS(\boldsymbol{\beta})_{\ell_2} &= \sum_{i=1}^{n}(y_i - \mathbf{z}_i^{\top}\boldsymbol{\beta})^2 + \lambda\sum_{j=1}^{p}\beta_j^2 \\
&= (\mathbf{y} - \mathbf{Z}\boldsymbol{\beta})^{\top}(\mathbf{y} - \mathbf{Z}\boldsymbol{\beta}) + \lambda||\boldsymbol{\beta}||_2^2
\end{aligned}
$$