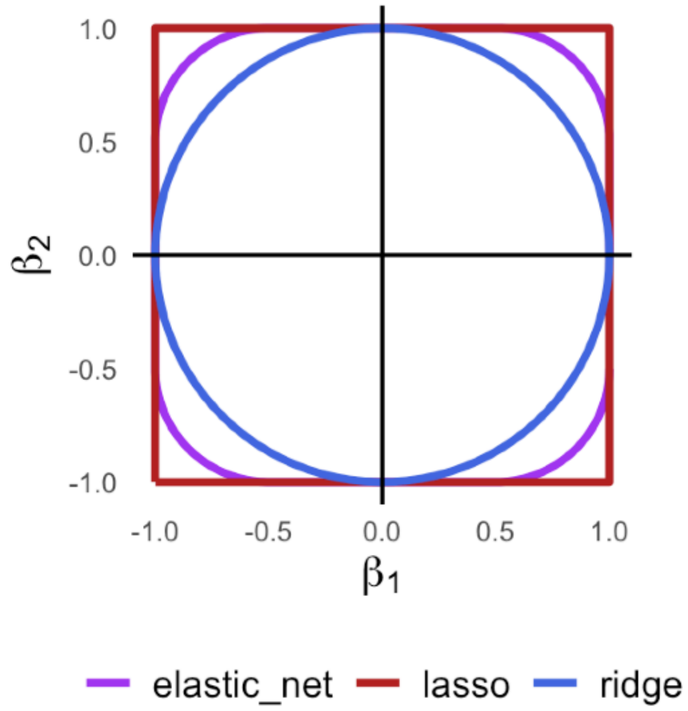
Hybrid Approach: Elastic Nets

$$\text{RSS} + \underbrace{\lambda_1 \sum_{j=1}^{p} \beta_j^2}_{\text{“ridge”}} + \underbrace{\lambda_2 \sum_{j=1}^{p} |\beta_j|}_{\text{“lasso”}}$$



λ_1 and λ_2 are regularization parameters controlling the strength of the penalties

- Helps stabilize the solution when predictors are correlated
- Shrinks some coefficients to zero, enabling feature selection
- Particularly useful for high-dimensional datasets with correlated predictors

Part III- Dimensionality Reduction

another strategy which aims to reduce dimensionality **before** applying LS

create q transformed variables which are linear combinations of the original predictors ($q < p$)

we return to this during our PCA lecture...