Exercise: Conjugate prior for univariate Gaussian in exponential family form

Derive the conjugate prior for μ and $\lambda = 1/\sigma^2$ for a univariate Gaussian using the exponential family. By suitable reparameterization, show that the prior has the form $p(\mu, \lambda) = \mathcal{N}(\mu|\gamma, \lambda(2\alpha - 1))\text{Ga}(\lambda|\alpha, \beta)$, and thus only has 3 free parameters.