

# STA 360: Assignment 3

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1. Marginal distribution of  $X$  is:

$$\begin{aligned} p(x) &= \int_0^\infty \text{Normal}(0, 1/\tau^2) \text{Gamma}(\nu/2, \nu/2) \\ &= \int_0^\infty \frac{1}{\sqrt{2\pi/\tau^2}} \exp\left\{-\frac{x^2}{2/\tau^2}\right\} \frac{(\nu/2)^{\nu/2}}{\Gamma(\nu/2)} (\tau^2)^{\nu/2-1} \exp\{-\nu/2\tau^2\} \end{aligned}$$