Final Exam Question 1

A random variable X is said to have a lognormal distribution with parameters μ and σ^2 if it has the following PDF:

$$\frac{1}{x\sqrt{2\pi\sigma^2}} e^{-\frac{(\ln x - \mu)^2}{2\sigma^2}} \text{ for } x > 0$$

Now suppose that data $x_1, \ldots, x_n$ are a random sample from a lognormal population with σ^2 known but μ unknown. Show that a $Normal(m, s^2)$ prior on μ is conjugate and find the parameters of the posterior distribution.
Show all working.