Math329: Exam 02 (Out of Class)

NAME:

Please answer the following questions and either (1) bring your solution to the in-class exam or (2) deposit a printed solution to my office by noon on Friday, March 3rd. You may consult any class notes you would like, but may not search the internet or discuss the question with anyone else. You may typeset your solution in LaTeX, but this is not required. These will count for 30% of the exam.

1. Consider the following random variables:

$$\lambda \sim Gamma(\alpha, \beta)$$
$$X|\lambda \sim Poisson(\lambda)$$

Find the distribution of $\lambda|X$. Hint: It should another Gamma with a different value of α and β.

2. Using the same variables as in question 1, compute $\mathbb{E}\lambda|X$ and $Var(\lambda|X)$.

3. Let $X \sim Gamma(\alpha, \beta)$. Find $\mathbb{E}X^{1/4}$.