Question 3)

Prior believe $\rightarrow$ $\lambda = \text{Uniform}(5, 10)$
$t = 1$ minute

μ = uniform (5, 10) arrivals per minute

Observation $\rightarrow$ 7 arrivals 1st minute
9 arrivals 2nd minute } M

Use Bayes theorem to determine the posterior distribution of values of lambda

$$pr(B|A) = \frac{pr(A|B)\, pr(B)}{pr(A)}$$

$\downarrow$

$$pr(\lambda | M) = \frac{pr(M | \lambda)\, pr(\lambda)}{pr(M)}$$

$pr(\lambda) = \text{Uniform}(5, 10)$

$$pr(M | \lambda) = pr(7 \text{ in } 1^{st} \text{ min} | \lambda) \cdot p(9 \text{ in } 2^{nd} \text{ min} | \lambda)$$

$$= 1/5 \cdot 1/5 = \frac{1}{25} = 0.04$$

$pr(M) = 1 \}$ given no past observations

$$p(x \underbrace{\mid m) = 0.04 \,\cdot}_{\text{This makes no sense!}} \mathrm{Uniform}(5,10)$$