1. The random variable X is uniformly distributed on $[0; a]$. The random variable Y is uniformly distributed on $[0; X]$.

   Find $(Y \mid X)$, (Y) and (Y).

2. Let $Y_t = \exp\left(-aW_t - \frac{a^2}{2}t\right)$.

   (a) Using Ito's lemma find dY_t

   (b) Using your previous result find (Y_t) and (Y_t)