Exercise 2

Consider a solution of the diffusion equation $u_t = u_{xx}$ in $\{0 \le x \le l,\ 0 \le t < \infty\}$.

(a) Let $M(T) =$ the maximum of $u(x,t)$ in the closed rectangle $\{0 \le x \le l,\ 0 \le t \le T\}$. Does $M(T)$ increase or decrease as a function of T?

(b) Let $m(T) =$ the minimum of $u(x,t)$ in the closed rectangle $\{0 \le x \le l,\ 0 \le t \le T\}$. Does $m(T)$ increase or decrease as a function of T?