These formula will be available on the second exam. You need to know what they mean and how they are used.

\[ u(x, t) = \sum_{n=1}^{\infty} e^{-\beta(n\pi/L)^2 t} \sin \frac{n\pi x}{L} \]

\[ u(x, t) = \sum_{n=1}^{\infty} \left( a_n \cos \frac{n\pi \alpha}{L} t + b_n \sin \frac{n\pi \alpha}{L} t \right) \sin \frac{n\pi x}{L} \]

\[ \int u \sin u \, du = \sin u - u \cos u \]

\[ \int u \cos u \, du = \cos u + u \sin u \]