MTH4SC 208, Fall 2010

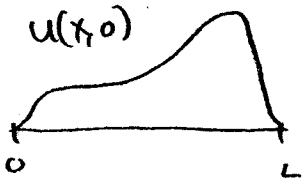
Week 12 summary:

- **Parseval's identity**: $\langle f(x), f(x) \rangle = \frac{1}{\pi}\int_{-\pi}^{\pi} (f(x))^2 \, dx = \frac{1}{2} a_0^2 + \sum_{n=1}^{\infty} a_n^2 + b_n^2$

  Can be used for computing sums! e.g., $\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$

- **Partial differential equations** (PDE's): Equations involving a multivariate function and its partial derivatives.

* **Heat equation**: $u_t = c^2 u_{xx}$, $u(x,t)$ = temp at pos. x, time t.



* **Boundary conditions**, e.g., $u(0,t) = u(L,t) = 0$

* **Initial condition**:, e.g., $u(x,0) = h(x)$
  (initial temp. of bar).