

$$Si(t) = \int_0^t \frac{\sin s}{s} ds$$

$$\sin t \rightarrow \frac{1}{p^2 + 1}$$

Integration theorem:

$$\frac{\sin t}{t} \rightarrow \int_p^\infty \frac{dp}{p^2 + 1} = \arctan p \Big|_p^\infty = \arctan \frac{1}{p}$$

$$Si(t) \rightarrow \frac{\arctan(1/p)}{p}$$