4. (8 points) **(a)** Give the Taylor series about the point t=0 of the function

$$f(t) = \frac{\sin t}{t}.$$

(You are allowed to use the standard Taylor series expansions without deriving them).

(b) Is the following statement "True" or "False"? Explain why, if true, or why not, if false.

The Taylor series about the point $x = 0$ *of the* sine integral *function, defined by*

$$Si(x) = \int_0^x \frac{\sin t}{t} \, dt,$$

is

$$\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)(2n+1)!} = x - \frac{x^3}{18} + \frac{x^5}{600} - \cdots + (-1)^n \frac{x^{2n+1}}{(2n+1)(2n+1)!} + \cdots.$$

True.   False.