

1. Use the series expansion of  $\arctan(x)$  to approximate  $\pi$  accurate within 0.001.

Hint: What is  $\arctan(1)$ ?

2. Use series to approximate the value of the following integrals accurate within 0.001.

(a)  $\int_0^1 \cos(x^3) dx$

(b)  $\int_0^{1/4} \frac{1}{1+x^4} dx$

Hint:  $\frac{1}{1+x^4} = \frac{1}{1-(-x^4)}$