1. Use the Maclaurin series for $\cos(x)$ to approximate $\cos(2)$ accurate within 0.01

2. Use the Maclaurin series for e^x to create the Maclaurin series for e^{-x^3}

3. Use your answer from 2 to create a Maclaurin series for xe^{-x^3}

4. What is the Maclaurin series for $f(x) = \dfrac{1}{1-x}$ where $|x| < 1$?
   Hint: Think about geometric series

1. Use series to approximate $\int_0^1 xe^{-x^3}\, dx$ accurate within 0.01

2. Use that $\dfrac{1}{1+x^2} = \dfrac{1}{1-(-x^2)}$ to find the Maclaurin series for $f(x) = \frac{1}{1+x^2}$

3. Use your answer from 2 to find the Maclaurin series for $\arctan(x)$

4. Approximate $\arctan(1)$ by using your series from 3 and using WolframAlpha to compute S_{100}