

1.
 - (a) Use the Maclaurin series for e^x to create the Maclaurin series for e^{-x^3}
 - (b) Use your answer from (a) to create a Maclaurin series for xe^{-x^3}
 - (c) Use your answer from (b) to approximate $\int_0^1 xe^{-x^3} dx$ accurate within 0.05

2.
 - (a) What is the Maclaurin series for $f(x) = \frac{1}{1-x}$ where $|x| < 1$?
Hint: Think about geometric series
 - (b) Use that $\frac{1}{1+x^2} = \frac{1}{1-(-x^2)}$ to find the Maclaurin series for $f(x) = \frac{1}{1+x^2}$
 - (c) Use your answer from (b) to find the Maclaurin series for $\arctan(x)$
 - (d) Approximate $\arctan(1)$ by using your series from (c) and computing S_{100}
You can use Desmos or WolframAlpha to compute S_{100}