NON-ELEMENTARY INTEGRALS WORKSHEET

APRIL 12, 2019

1. Compute the Maclaurin series for $e^{-z^2/2}$.

2. Compute the Maclaurin series for $\int e^{-z^2/2}\,dz$.

3. Use the first six terms of your series to find an approximation for $2\frac{1}{\sqrt{2\pi}}\int_0^1 e^{-z^2/2}\,dz$.

4. Use the first six terms of your series to find an approximation for $2\frac{1}{\sqrt{2\pi}}\int_0^2 e^{-z^2/2}\,dz$.

5. Do these numbers look familiar? What do they say about the proportion of the data that lie within one and two standard deviations of the mean?