

1. Let $f(x) = e^x$

(a) Find the Maclaurin series for $f(x)$

(b) Take the derivative of your series. What do you notice?

2. Let $g(x) = \ln(x)$.

(a) Find the Taylor series for $g(x)$ at $c = 1$

(b) Use your series to approximate $\ln(2)$.

8.8..26 Use the Taylor series for e^x to create the Taylor series for $f(x) = e^{-x}$

8.8.31 Approximate the value of

$$\int_0^{\sqrt{\pi}} \sin(x^2) dx$$

by using the first four nonzero terms of the integrand's Taylor series

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

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

2. $\int_0^{1/4} \frac{1}{1+x^4} dx$

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

3. $\int_0^1 xe^{x^3} dx$