

1.

(a) Develop or write the Maclaurin series for $f(x) = \cos x$.

(b) Use your answer to part (a) to write the Maclaurin series for $f(x) = \cos x^2$.

(c) Use your answer to part (b) to write the Maclaurin series for $f(x) = \frac{1 - \cos x^2}{x}$.

(d) Use your answer to part (c) to evaluate the definite integral $\int_0^1 \frac{1 - \cos x^2}{x} dx$ with accuracy to 4 decimal places.

2. Write the first five terms of the Taylor series for $f(x) = \ln x$ centered at $x = 2$.