Review Problem for Section 7.2

Evaluate the following integral in two ways, one of which should use the double angle formula:

\[
\int \sin^4 x \cos^2 x \, dx
\]

Review Problem for Section 7.5

Use substitution and the table of integrals to evaluate the following integrals

\[
\int \frac{x^3 + x + 1}{(x^2 + 1)^2} \, dx \quad \int \frac{\cos \theta}{\sqrt{5 + \sin^2 \theta}} \, d\theta
\]

Review Problem for Section 8.9

Use the binomial series to find the Maclaurin series for the function

\[
f(x) = \frac{1}{\sqrt{4 - x}}
\]

and its radius of convergence.