Quiz 20

Ma 16200

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Potentially useful information

\[
\cos x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots
\]

Problem 1:

Find the Maclaurin series of the function:

\[
f(x) = \cos(\sqrt{x})
\]

And use it to write a series expression for \( \cos(\sqrt{\pi}) \)

Problem 2:

Use the result from the previous problem to evaluate the integral as an infinite series:

\[
\int \frac{\cos(\sqrt{x})}{x} \, dx
\]

Problem 3:

Find the Taylor series for f(x) centered at a.

\[
f(x) = x^4 - 2x^2 + 4 \text{ where } a = 2
\]