6. Find the Maclaurin series for \( \cos x \) as far as the term in \( x^4 \).
Deduce the Maclaurin series for \( f(x) = \frac{1}{2} \cos 2x \) as far as the term in \( x^4 \).
Hence write down the first three non-zero terms of the series for \( f(3x) \).

Answers

\[
\cos x = 1 - \frac{x^2}{2} + \frac{x^4}{24} - \ldots
\]

\[
f(x) = \frac{1}{2} - x^2 + \frac{x^4}{3} - \ldots
\]

\[
f(3x) = \frac{1}{2} - 9x^2 + 24x^4 - \ldots
\]