Example

Given the equation \( y = x^2 \), find the average rate of change of \( y \) from \( x_1 = 1 \) to \( x_2 = 4 \).

**ANSWER:** \[ 5 \]

Solution: The average rate of change formula is given by

\[
\text{Average Rate of Change} = \frac{y_2 - y_1}{x_2 - x_1},
\]

where

\[
y_1 = (x_1)^2 = 1^2 = 1
\]

\[
y_2 = (x_2)^2 = 4^2 = 16.
\]

Thus

\[
\frac{y_2 - y_1}{x_2 - x_1} = \frac{16 - 1}{3} = 5
\]