First,

\[ i^2 = j^2 = k^2 = ijk = -1 \]

Here, from Definition series

\[
\begin{align*}
  i &= 2, \quad j = 3 \\
  k &= 4 \left( \because 4^2 = 4^3 = 64 = 4 \right)
\end{align*}
\]

\[
\begin{align*}
  i^2 &= 4 = -1 \\
  j^2 &= 9 = 4 = -1 \\
  k^2 &= 64 = 4 = -1 \\
  ijk &= 2 \times 3 \times 4 = 24 = 4 = -1
\end{align*}
\]

That’s all (proof end)