Consider the following recursive function \( F(n) \):

\[
\begin{align*}
\text{FUNCTION } F(n) : \text{REAL} \\
\text{if } n \leq 2 \text{ then} \\
\quad \text{return } (1) \\
\quad \text{else} \\
\quad \quad h := 0 \\
\quad \quad \text{for } i := 1 \text{ to } 4 \text{ do} \\
\quad \quad \quad h := h + i \times F(n - 2) \\
\quad \quad \text{od} \\
\quad \text{return } (h)
\end{align*}
\]

1. Analyse both, running time and memory consumption of this recursive function. Provide best possible asymptotic bounds for each of them.

2. Develop an alternative version of this function which is (asymptotically) as efficient w.r.t. time and space requirements as possible.

Prove your claims and provide all steps of your reasoning.