(a) What does the ML function map do? Give an example, first coded without map and then with it, to illustrate how it can lead to more compact or comprehensible code. [3 marks]

(b) Functions foldl and foldr might be defined as

\[
\begin{align*}
\text{fun foldl} \ f \ (e, \ []) & = e \\
& | \text{foldl} \ f \ (e, \ x::xs) = \text{foldl} \ f \ (f(e,x), \ xs);
\end{align*}
\]

\[
\begin{align*}
\text{fun foldr} \ f \ ([], \ e) & = e \\
& | \text{foldr} \ f \ (x::xs, \ e) = f(x, \ \text{foldr} \ f \ (xs,e));
\end{align*}
\]

Explain what these two functions do and why they may be useful. [4 marks]

(c) Here is a typical use of map:

\[
\begin{align*}
\text{fun mangle} \ n & = (n-2)*(n+7); \\
\text{fun manglelist} \ x & = \text{map} \ \text{mangle} \ x;
\end{align*}
\]

Show how to express manglelist using one of the “fold” functions rather than map. [3 marks]