Problem  There is a program, `divide0`, in your notes to partition a list into two nearly equal-sized lists (see section 9.5). The solution uses mutual recursion. Give a solution without using mutual recursion, i.e., define a function `divide` with the same interface which calls only itself.

Solution

```latex
\begin{align*}
\text{divide} \ [\] &= ([], []) \\
\text{divide} \ [x] &= ([x], []) \\
\text{divide} \ (x:(y:ys)) &= (x:f, y:g) \\
&\quad \text{where } (f, g) = \text{divide} \ ys
\end{align*}
```