```
-- q :: Nat -> Nat is a sequence, ms q n multiplies its first n elements
haskell_ms q n = foldr (*) 1 [ q k | k <- [0..n-1] ]
```

Without shortcut

$$
\begin{array}{l}
\texttt{fix}\ ms\ \text{is} \\
\quad \lambda\, q : \mathbb{N} \to \mathbb{N}. \\
\quad\quad \lambda\, n : \mathbb{N}. \\
\quad\quad\quad \text{case}\ n\, \{ \\
\quad\quad\quad\quad z \ \mapsto q(z) \\
\quad\quad\quad\quad \text{succ}(n') \ \mapsto q(z) \cdot ms(q \circ \text{succ})(n') \\
\quad\quad\quad\quad \}
\end{array}
$$

With shortcut

$$
\begin{array}{l}
\lambda q' : \mathbb{N} \to \mathbb{N}. \\
\quad \lambda n' : \mathbb{N}. \\
\quad\quad \text{letcc}\ ret\ \text{in} \\
\quad\quad\quad (\texttt{fix}\ ms\ \text{is} \\
\quad\quad\quad\quad \lambda\, q : \mathbb{N} \to \mathbb{N}. \\
\quad\quad\quad\quad\quad \lambda\, n : \mathbb{N}. \\
\quad\quad\quad\quad\quad\quad \text{case}\ n\, \{ \\
\quad\quad\quad\quad\quad\quad\quad z \ \mapsto q(z) \\
\quad\quad\quad\quad\quad\quad\quad \text{succ}(n') \mapsto \ \text{if}\ q(z) = 0\ \text{then throw}\ z\ \text{to}\ ret \\
\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad \text{else}\ q(z) \cdot ms(q \circ \text{succ})(n') \\
\quad\quad\quad\quad)(q')(n')
\end{array}
$$