$$
\begin{aligned}
&1 + x + x^2 + x^3 + ... + x^n = Q \\
&\Leftrightarrow x + x^2 + x^3 + ... + x^n + x^{n+1} = Q + x^{n+1} - 1 \\
&\Leftrightarrow x * \left(1 + x + x^2 + ... + x^n\right) = Q + x^{n+1} - 1 \\
&\Leftrightarrow x * Q = Q + x^{n+1} - 1 \\
&\Leftrightarrow (x - 1) * Q = x^{n+1} - 1 \\
&\Leftrightarrow Q = \frac{x^{n+1} - 1}{x - 1}
\end{aligned}
$$