

$$\begin{aligned} \boxed{5.42} \quad \omega & \quad q^2 = \frac{j}{-j} = -i & \quad S_{2n} &= \frac{-1(q^{2n}-1)}{q-1} = \frac{-1((q^2)^{4n}-1)}{q-1} = \frac{-1[(-i)^{4n}-1]}{q-1} \\ & & &= \frac{-1(((i)^4)^n-1)}{q-1} = \frac{-1(i^4-1)}{q-1} = \frac{-1 \cdot 0}{q-1} = 0 \end{aligned}$$