[mfms 08.1] Let $\omega$ be a primitive $7^{th}$ root of unity, and $\xi = \omega + \omega^{-1}$. Observe that $\xi^3 + \xi^2 - 2\xi - 1 = 0$. Express $\xi$ as a linear combination of Gauss sums mod 7.

[mfms 08.2] (*) Find the precise congruence condition on primes $p$ for there to be a solution of $x^3 + x^2 - 2x - 1 = 0$ in $\mathbb{Z}/p$. 