

OMK 2014 - Suloreg (3 July 2015)

(B2) Denote (remember, that we wish to find the value of A_0):

$$A_0 = a_0 + a_3 + a_6 + \dots + a_{2023065}$$

$$A_1 = a_1 + a_4 + a_7 + \dots + a_{2023066}$$

$$A_2 = a_2 + a_5 + a_8 + \dots + a_{2023064}$$

Then, compute:

$$\begin{aligned} f(w^3) &= f(1) \\ &= \prod_{k=1}^{2011} (1+k^k) \\ &= \prod_{k=1}^{2011} 2 \\ &= 2^{2011} \end{aligned}$$

i.e. $2^{2011} = f(w^3) \sim \textcircled{4}$

Next, $f(w) = \prod_{k=1}^{2011} (1+w^k)$

$$= (1+w^1)(1+w^2)(1+w^3) \times \dots \times (1+w^{2011})$$

$$= \prod_{m=1}^{670} (1+w^{3m}) \times \prod_{j=0}^{670} (1+w^{3j+1}) \times \prod_{k=0}^{669} (1+w^{3k+2})$$

... continued to next page.