

OMK 2014-Sulong (3 July 2015)

$$\textcircled{B2} \text{ So, } f(w) = \prod_{m=1}^{670} (1 + (w^3)^m) \times \prod_{j=0}^{670} (1 + (w^3)^j \times w) \times \prod_{k=0}^{669} (1 + (w^3)^k \cdot w^2)$$

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

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

$$= 2^{670} \times \left( \prod_{j=0}^{670} (-w^2) \right) \times \left( \prod_{k=0}^{669} (-w) \right)$$

using 3a

using 3b

$$= 2^{670} \times \left( \prod_{j=0}^{669} \frac{-w^2}{\cancel{-w}} \right) \times (-w^2)$$

$$= 2^{670} \times \left( \prod_{j=0}^{669} (+w^3) \right) \times (-w^2)$$

$$= 2^{670} \times 1 \times (-w^2)$$

$$= -2^{670} w^2$$

Thus,

$$f(w) = -2^{670} w^2 \quad \textcircled{5}$$