

系所：_____ 學號：_____ 姓名：_____ (3/6)

Determine the coefficient of x^{15} in $F(x) = (x^2 + x^3 + x^4 + \dots)^4$. (請詳列計算過程)

Sol.
$$\begin{aligned} F(x) &= (x^2(1+x+x^2+\dots))^4 \\ &= x^8(1+x+x^2+\dots)^4 \\ &= x^8(1/(1-x))^4 \\ &= x^8(1-x)^{-4}. \end{aligned}$$

The answer is the coefficient of x^7 in $(1-x)^{-4}$, which is

$$\binom{-4}{7}(-1)^7 = 120.$$