

系所：_____ 學號：_____ 姓名：_____ (3/13)

Find a_{12} if $a_{n+1}^2 = 5a_n^2$, $a_n > 0$, $n \geq 0$, $a_0 = 2$. (請詳列計算過程)

Sol. Let $b_n = a_n^2$.

$$b_{n+1} = 5b_n, n \geq 0, b_0 = 4.$$

$$b_{n+1} = 5b_n$$

$$= 5(5b_{n-1})$$

$$= 5^2(5b_{n-2})$$

$$= 5^3(5b_{n-3})$$

$$= \dots$$

$$= 5^{n+1}(b_0)$$

$$= 4 \cdot 5^{n+1}$$

$$\Rightarrow b_{12} = 4 \cdot 5^{12}.$$

$$a_{12} = (b_{12})^{1/2} = 2 \cdot 5^6 = 31250.$$