Sec 1.1   Ex 16

$P_m$,  $m = 0, 1, 2, \ldots$   is probability that a policy holder will file $m$ claims (on a five-year period)

Told that   $P_{m+1} = \frac{1}{4} P_m$,   $m = 0, 1, 2, \ldots$   so that   $P_0 \Rightarrow P_1 = \frac{1}{4} P_0 \Rightarrow P_2 = \left(\frac{1}{4}\right)^2 P_0 \Rightarrow \cdots$

$$\Rightarrow P_m = \left(\frac{1}{4}\right)^n P_0$$

Define the event   $A :$ "policy holder files two or more claims"

Then   $P(A) = 1 - P(\bar{A})$   where   $\bar{A} :$ "policy holder files less than 2 claims"

$$= 1 - \underbrace{(P_0 + P_1)}_{P(\bar{A})} = 1 - P_0 - P_1 = 1 - P_0 - \frac{1}{4} P_0$$

All that remains to be done is to find $P_0$:

We know that   $\sum_{m=0}^{\infty} P_m = 1$   and   so   $\sum_{n=0}^{\infty} \left(\frac{1}{4}\right)^n P_0 = 1 \iff P_0 \sum_{n=0}^{\infty} \left(\frac{1}{4}\right)^n = 1$

$\overset{\left(\frac{1}{4}\right)^n P_0}{}$

Hence $P(A) = 1 - P_0 - \frac{1}{4} P_0 = 1 - \frac{3}{4} - \frac{1}{4} \cdot \frac{3}{4} = \frac{1}{16}$     $\iff P_0 \dfrac{1}{1 - \frac{1}{4}} = 1 \iff P_0 = \frac{3}{4}$