ASSUME A BRANCHING PROCESS HAS OFFSPRING DISTRIB. $a = \left(\frac{1}{5}, \frac{2}{5}, \frac{2}{5}, 0 \ldots\right)$

COMPUTE THE PROBABILITY OF EXTINCT.

$$\mu = \frac{1}{5} \cdot 0 + \frac{2}{5} \cdot 1 + \frac{2}{5} \cdot 2 = \frac{6}{5} > 1$$

WANT TO FIND ROOT OF $G(s) = s$

$$G(s) = \frac{1}{5} + \frac{2}{5}s + \frac{2}{5}s^2$$

SOLVE $\frac{1}{5} + \frac{2}{5}s + \frac{2}{5}s^2 = s$

$$2s^2 - 3s + 1 = 0$$

NOTE THAT, ALWAYS, $G(1) = 1$

$$(s-1)(2s-1) = 0$$

SMALLEST POSITIVE ROOT IS $\frac{1}{2}$. EXTINCTION PROB