9]

X = "nombre tirades fins obtenir un 1"

Y = "nombre tirades fins obtenir un 5 o un 6"

a] $P(X=k) = \left(\frac{5}{6}\right)^{k-1} \frac{1}{6} \qquad k \geq 1$

$X \sim$ Geomètrica $(p) \qquad p = \frac{1}{6}$

b] $P(Y=k) = \left(\frac{2}{3}\right)^{k-1} \frac{1}{3} \qquad k \geq 1$

$Y \sim$ Geomètrica $\left(\frac{1}{3}\right)$

c] $P(X>3) = \left(\frac{5}{6}\right)^3$

$$P(X>3) = \sum_{k=4}^{\infty} P(X=k) = \sum_{k=4}^{\infty} \left(\frac{5}{6}\right)^{k-1} \frac{1}{6}$$

$$= \frac{1}{6} \sum_{k=0}^{\infty} \left(\frac{5}{6}\right)^{3+k} = \frac{1}{6} \left(\frac{5}{6}\right)^3 \left(\sum_{k=0}^{\infty} \left(\frac{5}{6}\right)^k \right) = \left(\frac{5}{6}\right)^3$$

$$\sum_{k=0}^{\infty} r^k = \frac{1}{1-r} \qquad |r|<1$$

$$\sum_{k=0}^{\infty} \left(\frac{5}{6}\right)^k = \frac{1}{1-\frac{5}{6}} = \frac{1}{\frac{1}{6}} = 6$$