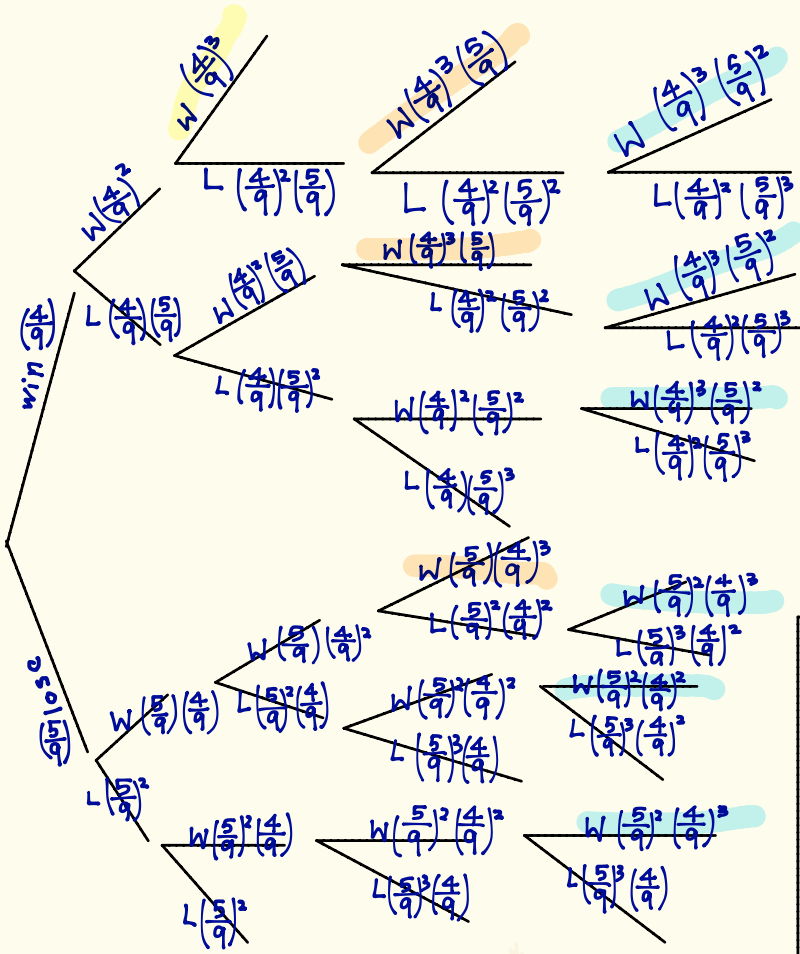

OR.....

WWW $= (\frac{4}{9})^3$

WWLW $= (\frac{4}{9})^3(\frac{5}{9})$

WLWW

WWLLW

WLWLW

WLLWW

LWWW

LWWLW

LWLWW

LLWWW

$$P(\text{win}) = (\tfrac{4}{9})^3 + (\tfrac{5}{9})(\tfrac{4}{9})^3(3) + (\tfrac{5}{9})^2(\tfrac{4}{9})^3(6) = \frac{7808}{19683}$$