Problem 2.1. (10 pts) The evolution of effective annual interest rates is modeled with a one-step binomial tree with
\[ r_0 = 0.04, \quad r_u = 0.05 \]
\[ r_d = 0.03. \]
Assuming that the risk-neutral probability of the interest rate taking a step up equals 0.75, what is the price of a zero-coupon bond redeemable at time−2 for $100?

Solution:
\[
\frac{100}{1.04} \left[ 0.75 \times \frac{1}{1.05} + 0.25 \times \frac{1}{1.03} \right] = 92
\]