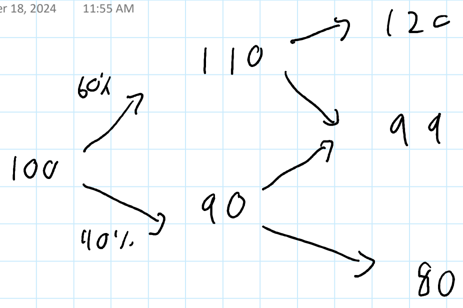
Problem 5

Friday, October 18, 2024 11:55 AM



Find the implied risk neutral rate, p is improving world, and $1-p$ is decreasing world

The current price should be the expected price under the risk neutral measure

Thus,

$$100 = p \cdot 120 + (1-p)\, 80$$

$$100 = 120p + 80 - 80p$$

$$p = \frac{1}{2}$$

In a improving world the payoff will be $110 - 100 = 10$
and if the world worsen the payoff will be 0

Expected payoff,

$$E[P] = p \cdot 10 + p \cdot 0 = \frac{1}{2} \cdot 10 + 0 = 0$$

the expected payoff for the one month call option on S_n strike price is \$ 5