Problem 3

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What is the present value of the uncertain payment stream in the table? Time is measured with the present being 0. P(End) is the probability the payment stream is permanently terminated before that period's payment is made, conditional on the previous period's payment having been made. So, you have to work out the probability the venture survives long enough for each payment to be made. The riskless annual rate of return is 4%.

Time	1	3	6	10
P(End)	0.1	0.1	0.4	0.7
Value	-10	-5	60	1000

$$V = \left(\frac{-10}{1.04^1}\right)(.9) - \left(\frac{5}{1.04^3}\right)(.9\cdot.9) + \left(\frac{60}{1.04^6}\right)(.9\cdot.9\cdot.6) + \left(\frac{1000}{1.04^{10}}\right)(.9\cdot.9\cdot.6\cdot.3)$$

$$= -8.56 - 3.60 + 23.045 + 98.497$$

$$= 109.2885$$

Multiplying probabilities because each one is conditional on the ones before it being true