Bayesian estimation of Expectation in Bernoulli problem

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- *From*: quebecstat@xxxxxxx
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Hi everyone

I would be interested in a hint, a pointer or some help with the following problem.

Consider two coins, C1 and C2, with the following characteristics: Pr(headsIC 1) = 0.6 and Pr(headsIC2) = 0.4.

Choose one of the coins at random and imagine spinning it repeatedly. Given that the first two spins from the chosen coin are tails, what is the expectation of the number of additional spins until a head shows up?

Below I have indicated my work so far.

Many thanks

Let N be the number of additional spins until a head shows up
We have N|Pr(heads)=Geometric(Pr(heads))
and E{N|Pr(heads)}=1/Pr(heads)

E{N}=E[E{N|Pr(heads)}]=E[1/Pr(heads)]

Now I need to find Pr(heads)

Pr(heads|first 2 spins are tails, C1)= ((1−p)^2 *0.6) /((1−p)^2 *0.6+(1−p)^2 *.4)
I am not sure if I am going in the direction and how to connect the dots.

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