

Situation: Geometric

You flip a coin (which comes up heads with probability p) until you get a heads. How many flips did you need?

More generally: how many independent trials are needed until the first success?

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Formally...

Let X be the total number of flips needed, Y be the flips after the second.

$$\mathbb{P}(Y = k | X \geq 3) = ?$$

...

Which is $p_X(k)$.

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