Ground rules: Open notes in own handwriting or typed by one self. No other resources allowed. Individual work.

1. Suppose the number of earthquakes that occur in a year, anywhere in the world, is a Poisson random variable with mean λ. Suppose the probability that any given earthquake has magnitude at least 5 on the Richter scale is p independent of all other quakes. Let $N \sim \text{Poisson}(\lambda)$ be the number of earthquakes in a year and let M be the number of earthquakes in a year with magnitude at least 5. Find the distribution of M.