

Emails arrive in Emma X. Ponential's inbox according to a Poisson process at a rate of 5 emails per hour. Each email independently is

|                                   |                       |
|-----------------------------------|-----------------------|
| spam                              | with probability 50%  |
| interesting but requires no reply | with probability 40%  |
| interesting and requires a reply  | with probability 10%. |

She also gets texts according to an independent Poisson process at a rate of 3.5/hour. She considers all texts interesting.

1. How many email replies does she expect to write in a day?
2. Find the standard deviation for your answer to question 1.
3. What is the probability her first interesting message of the day is a text?
4. What is the probability she gets interrupted more than once by a text during a 50 minute class?
5. What is the probability she receives no texts or interesting emails during her half hour lunch break?
6. The time it takes Emma to reply to an email is (of course) exponentially distributed with a mean of 2 minutes. Over the course of a day, what is the total expected amount of time she spends writing replies?