## **Quiz 5 - 9 October 2019**

**Instructions.** You have 15 minutes to complete this quiz. You may use your calculator. You may <u>not</u> use any other materials (e.g., notes, homework, books).

Show all your work. To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

Problem	Weight	Score
1	1	
2	1	
3	1	
4	1	
Total		/ 40

For Problems 1-3, consider the following setting.

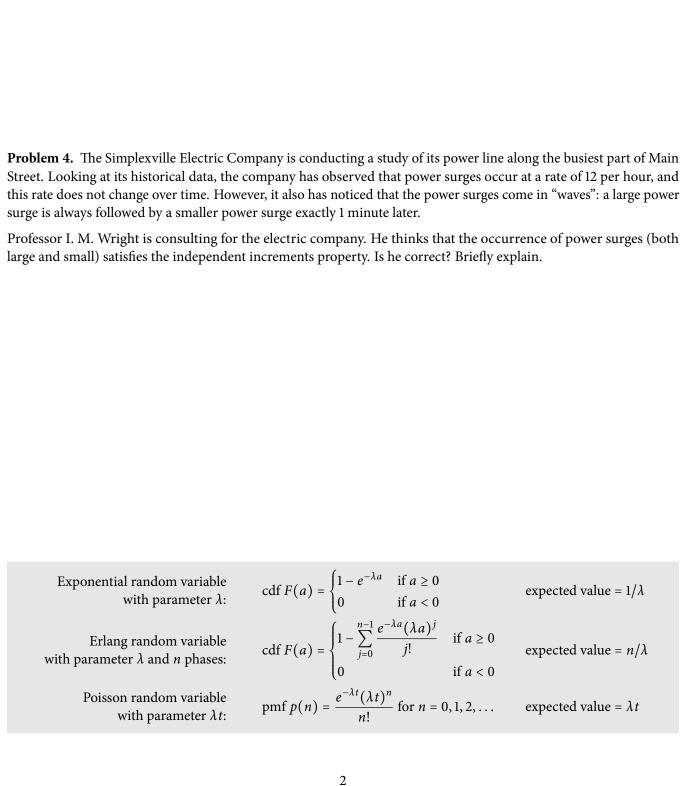
The Simplexville Emergency Dispatch receives phone calls according to a nonstationary Poisson arrival process with integrated rate function

$$\Lambda(\tau) = \begin{cases} 3\tau & \text{if } 0 \le t < 8\\ 5\tau - 16 & \text{if } 8 \le t < 20\\ \frac{3}{2}\tau + 54 & \text{if } 20 \le t \le 24 \end{cases}$$

where  $\tau$  is in hours and  $\tau = 0$  corresponds to 0:00.

Problem 1. What is the probability that 12 or fewer phone calls have been received between 6:00 and 10:00?

**Problem 2.** If exactly 50 phone calls have been received between 0:00 and 12:00, what is the probability that 100 or fewer phone calls have been received over the course of the entire day (0:00 - 24:00)?



**Problem 3.** In words, briefly describe the meaning of  $\Lambda(12)$  in the context of this problem.