Evan Louie

WeBWorK assignment `Assignment-05` is due on 11/18/2012 at 10:00pm PST.

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1. (6 pts) The number of major faults on a randomly chosen 1 km stretch of highway has a Poisson distribution with mean 1.2. The random variable X is the distance (in km) between two successive major faults on the highway.

Part a) What is the probability of having at least one major fault in the next 2 km stretch on the highway? Give your answer to 3 decimal places. ___

Part b)

Which of the following describes the distribution of X, the distance between two successive major faults on the highway?

- A. $X \sim \text{Poisson}(1.2)$
- B. $X \sim \text{Exponential}(\text{mean} = \frac{1}{1.2})$
- C. $X \sim \text{Poisson}(2 \cdot 1.2)$
- D. $X \sim \text{Exponential}(\text{mean} = 2 \cdot 1.2)$
- E. $X \sim \text{Exponential}(\text{mean} = \frac{1}{2 \cdot 1.2})$

Part c)

What is the mean distance (in km) and standard deviation between successive major faults?

- A. mean = 1.2; standard deviation = 1.2
- B. mean = 2.4000; standard deviation = 2.4000
- C. mean = 0.8333; standard deviation = 0.6944
- D. mean = 0.4167; standard deviation = 0.4167
- E. mean = 0.8333; standard deviation = 0.8333

Part d) What is the median distance (in km) between successive major faults? Give your answer to 2 decimal places. ___

Part e) What is the probability that the next four major faults along the highway exceeds 3 km? Give your answer to 3 decimal places. ___

Part f) By using Central Limit Theorem, what is the approximate probability that the next 33 major faults along the highway exceeds 25 km? Give your answer to 3 decimal places. ___

Answer(s) submitted:

- `0.909`
- `B`
- `D`
- `0.83177`
- `0.191`
- `.7257`

(score 0.333333343267441)

Correct Answers:

- `0.9093`
- `B`
- `E`
- `0.58`
- `0.515`
- `0.699`

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2. (2 pts) The Statistical Tutorial Centre has been designed to handle a maximum of 25 students per day. Suppose that the number X of students visiting this centre each day is a normal random variable with mean 15 and variance 16.

Part a) What is the return period for this centre rounded to the nearest day? ___

Part b) What is the probability that the design number of visits will not be exceeded before the 10th day? Leave your answer in 3 decimal places. ___

Answer(s) submitted:

- `161`
- `0.946`

(correct)

Correct Answers:

- `161`
- `0.9455`

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3. (2 pts) The time in hours for a worker to repair an electrical instrument is a Normally distributed random variable with a mean of μ and a standard deviation of 50. The repair times for 12 such instruments chosen at random are as follows:

183 222 303 262 178 232 268 201 244 183 201 140

Part a) Find a 95(___ , ___).

Part b) Find the least number of repair times needed to be sampled in order to reduce the width of the confidence interval to below 27 hours. ___

Answer(s) submitted:

- `189.793`
- `246.373`
- `53`

(correct)

Correct Answers:

- `189.793`
- `246.373`
- `53`