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WeBWorK assignment `Assignment-03` is due on 10/21/2012 at 09:00pm PDT.

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1. (4 pts) You are working on a programming project with your partner for a computer science course. The project is due in 48 hours. Together, you are to produce a computer program and each of you are assigned to write a portion of computer code. Both of you work simultaneously, but independently. The completion time of your task follows a uniform distribution between 30 and 50 hours. Your partner is stronger in programming and his task is more complex, and the completion time for his task follows a uniform distribution between 36 and 52 hours.

Part a) What is the expected completion time (in hours) for your partner's task?

- A. 44
- B. 40
- C. 43
- D. 48
- E. 51.5

Part b) What is the corresponding standard deviation for the completion time of your partner's task?

- A. 21.33
- B. 2.11
- C. 1.15
- D. 4.62
- E. 2.22

Part c) What is the probability that you and your partner are not able to hand in your project on time (that is, your team's project completion time exceeds 48 hours)?

- A. 0.5455
- B. 0.4888
- C. 0.5200
- D. 0.3250
- E. 0.6823

Part d) On the 48th hour when the project is due, you and your partner have not completed the project. You approach the course instructor for an extension. The course instructor grants you and your partner an extension of 4 hours to hand in the project starting from the 48th hour. What is the probability you and your partner are now able to meet the new deadline?

- A. 0.775
- B. 0.6888
- C. 0.3175
- D. 0.4375
- E. 1.0000

Answer(s) submitted:

- A
- D
- D
- E

(correct)
Correct Answers:

- A
- D
- D
- E

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2. (1 pt) A random variable X follows a Normal distribution with mean $\mu = 39$ and standard deviation $\sigma = 3$.

Which of the following gives the expectation $E(X^2)$?

- A. 1521
- B. 1764
- C. 1530
- D. 1512
- E. Insufficient information to calculate $E(X^2)$

Answer(s) submitted:

- A

(incorrect)
Correct Answers:

- C

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3. (1 pt) The lengths of a certain type of chain are approximately Normally distributed with a mean of 2.6 cm and a standard deviation of 0.2 cm.

Find the value of ℓ such that $P(L > \ell) = 0.01$

- A. 2.69 cm
- B. 2.60 cm
- C. 6.26 cm
- D. 0.20 cm
- E. 3.07 cm

Answer(s) submitted:

- E

(correct)
Correct Answers:

- E

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4. (1 pt) A random variable X is normally distributed, with a mean of 35 and a standard deviation of 1.8.

Which of the following is the appropriate interquartile range for this distribution?

- A. $35.45 - 34.55 = 0.90$
- B. $36.22 - 33.78 = 2.44$
- C. $37.19 - 32.81 = 4.38$

- D. $35.59 - 34.41 = 1.18$
- E. $36.05 - 33.95 = 2.10$

Answer(s) submitted:

- B

(correct)

Correct Answers:

- B

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5. (3 pts) You purchase a chainsaw, and can buy one of two types of batteries to power it, namely Duxcell and Infinitycell. Batteries of each type have lifetimes before recharge that can be assumed independent and Normally distributed. The mean and standard deviation of the lifetimes of the Duxcell batteries are 10 and 2 minutes respectively, the mean and standard deviation for the Infinitycell batteries are 16 and 2 minutes respectively.

Part a)

What is the probability that a Duxcell battery will last longer than an Infinitycell battery? Give your answer to two decimal places. ___

Part b)

What is the probability that an Infinitycell battery will last more than twice as long as a Duxcell battery? Give your answer to two decimal places. ___

Part c)

You are going to cut down a large tree and do not want to break off from the job to recharge your chainsaw battery. You buy two Duxcell batteries, and plan to use one until it runs out of power, after which you immediately replace it with the second battery. How long (in minutes) can the job last so that with probability 0.75 you can complete the job using the two Duxcell batteries in sequence?

Provide your answer to 1 decimal place. ___

Answer(s) submitted:

- 0.017
- 0.1587
- 22.7

(score 0.333333343267441)

Correct Answers:

- 0.0169
- 0.1855
- 18.1