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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » **Data Science For Engineers (course)**

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Course outline

How does an NPTEL online course work? ()

Setup Guide ()

Pre Course Material ()

Week 3: Assignment 3

The due date for submitting this assignment has passed.

Due on 2023-08-16, 23:59 IST.

As per our records you have not submitted this assignment.

A six sided die is marked '1' on one face, '2' on two of its faces, and '3' on the remaining three faces. The die is thrown twice. Let X denotes the total score in two throws.

Based on the above information, answer questions (1), (2).

1) Find the value of $P(X > 2.5 | X < 5)$. (Enter the answer correct to 2 decimal places).
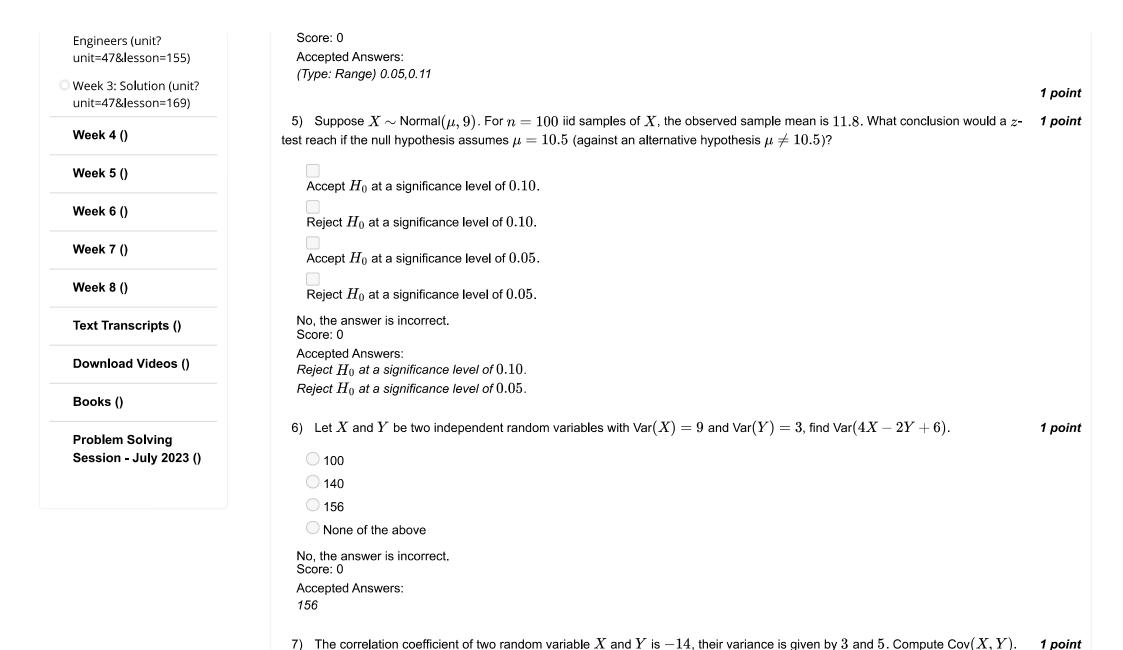
No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 0.80,0.86

1 point

2) Find the expected value of X.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 4

1 point

3) Suppose $X \sim \text{Normal}(\mu, 4)$. For $n = 20$ iid samples of X, the observed sample mean is 5.2. What conclusion would a z-test **1 point** reach if the null hypothesis assumes $\mu = 5$ (against an alternative hypothesis $\mu \neq 5$) at a significance level of $\alpha = 0.05$?
Use $F_z^{-1}(0.025) = -1.9599$

○ Accept H_0

○ Reject H_0

No, the answer is incorrect.
Score: 0

Accepted Answers:
Accept H_0

4) A pharmaceutical company is testing a new drug. The probability that a patient experiencing a side effect from this drug is 0.10. If the drug is given to 5 patients, what is the probability that more than 1 patient will experience the side effect? (Enter the answer correct to 2 decimal places.)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 0.05,0.11

1 point

5) Suppose $X \sim$ Normal$(\mu, 9)$. For $n = 100$ iid samples of X, the observed sample mean is 11.8. What conclusion would a z-test reach if the null hypothesis assumes $\mu = 10.5$ (against an alternative hypothesis $\mu \neq 10.5$)?   *1 point*

☐
Accept H_0 at a significance level of 0.10.

☐
Reject H_0 at a significance level of 0.10.

☐
Accept H_0 at a significance level of 0.05.

☐
Reject H_0 at a significance level of 0.05.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Reject H_0 at a significance level of 0.10.
Reject H_0 at a significance level of 0.05.

6) Let X and Y be two independent random variables with Var$(X) = 9$ and Var$(Y) = 3$, find Var$(4X - 2Y + 6)$.   *1 point*

○ 100

○ 140

○ 156

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
156

7) The correlation coefficient of two random variable X and Y is -14, their variance is given by 3 and 5. Compute Cov(X, Y).   *1 point*

○ -0.854

○ 0.561

○ -0.968

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
-0.968

8) A sample of N observations are independently drawn from a normal distribution. The sample variance follows **1 point**

○ Normal distribution

○
Chi-square with N degrees of freedom

○
Chi-square with $N - 1$ degrees of freedom

○
t-distribution with $N - 1$ degrees of freedom

No, the answer is incorrect.
Score: 0

Accepted Answers:
Chi-square with $N - 1$ degrees of freedom

9) A car manufacturer purchases car batteries from two different suppliers. Supplier X provides 55% of the batteries and supplier **1 point**
Y provides the rest. 5% of all batteries from supplier X are defective and 4% of all batteries from supplier Y are defective. You select a
battery from the bulk and you found it to be defective. What is the probability that it is from Supplier X?

○ 0.0455

○ 0.455

○ 0.0275

○ 0.018

No, the answer is incorrect.

Score: 0

10) Find the *t*-statistic for the sample data, given that the population mean of the distribution is 8.

1 point

| 5 | 2 | 8 | 9 | 4 | 6 | 7 | 2 | 4 | 6 |

○ -3.155

○ 8.33

○ -2.99

○ None of the above

No, the answer is incorrect.
Score: 0