
Started on Sunday, 21 April 2024, 8:01 PM

State Finished

Completed on Sunday, 21 April 2024, 8:47 PM

Time taken 46 mins 52 secs

Grade 8.00 out of 12.00 (66.67%)

Question 1

Correct

Mark 2.00 out of 2.00

The probability distribution of a random variable X is: $f(x) = k \sin \frac{1}{5}\pi x$, $0 \leq x \leq 5$. Determine the constant k and obtain the median of the distribution, respectively.

- ☐ a. $\frac{3\pi}{5}, \frac{5}{2}$
- ☒ b. $\frac{\pi}{10}, \frac{5}{2}$ ✓
- ☐ c. $\frac{\pi}{5}, \frac{1}{5}$
- ☐ d. $\frac{1}{10}, \frac{2}{5}$

The correct answer is: $\frac{\pi}{10}, \frac{5}{2}$

Question 2

Correct

Mark 2.00 out of 2.00

In a book of 520 pages, 390 typo-graphical errors occur. Assuming Poisson law for the number of errors per page, what percentage of find the probability that a random sample of 5 pages will contain no error.

- ☒ a. 0.02 ✓
- ☐ b. 0.14
- ☐ c. 0.23
- ☐ d. 0.47

The correct answer is: 0.02



Question 3

Correct

Mark 2.00 out of 2.00

$X \sim B(n, p)$, then which of the following is false?

- ☐ a. $E\left(\frac{X}{n} - p\right)^2 = \frac{p(1-p)}{n}$
- ☐ b. $V(X) < E(X)$
- ☐ c. $E(X^3) = np(1-p)(1-2p)$
- ☒ d. If $Y = n - X$, then $Y \sim B(n, p)$. ✓

The correct answer is: If $Y = n - X$, then $Y \sim B(n, p)$.

Question 4

Incorrect

Mark 0.00 out of 2.00

X is a normally distributed with mean 30 and standard deviation 5. Which of the following statement is incorrect?

- ☐ a. $P(26 \leq X \leq 40) = 0.7653$
- ☐ b. $P(X \geq 45) = 0.0013$
- ☐ c. $P(|X - 20| \geq 5) = 0.7642$
- ☒ d. $P(|X - 30| \leq 5) = 0.3174$ ✗

The correct answer is: $P(|X - 20| \geq 5) = 0.7642$



Question 5

Correct

Mark 2.00 out of 2.00

Let $X \sim N(\mu, \sigma^2)$. If $\sigma^2 = \mu^2$, ($\mu > 0$), express $P(X < -\mu \mid X < \mu)$ in terms of cumulative distribution function of $N(0, 1)$.

- ☐ a. $2[1 - \phi(-2)]$
- ☐ b. $0.5\Phi(-2)$
- ☐ c. None of these.
- ☒ d. $2[1 - \Phi(2)]$ ✓

The correct answer is: $2[1 - \Phi(2)]$

Question 6

Incorrect

Mark 0.00 out of 2.00

If X is a Poisson variable with mean m . Let $Y = \frac{X-m}{\sqrt{m}}$, then which of the following is incorrect ?

- ☐ a. None of these
- ☐ b. $\lim_{m \rightarrow \infty} M_Y(t) = e^{t^2/2}$
- ☐ c. $V(Y) = 1$
- ☒ d. $E(Y) = 0$ ✗

The correct answer is: None of these

