B.Tech COED-II, Sem-IV Quiz Subject-MA-212 (Linear Algebra & Statistical Analysis), Date : 26/04/2021, Time duration: 11:30am-12:00 pm, Marks-20

* Required

Instructions

Instructions:
(1) Attempt all questions.
(2) Use usual notations.
(3) Late turn-ins not allowed.

If Null hypothesis is true and we reject it, is called_____ *

- (●) Type-I error
- ( ) Sampling error
- ( ) Type-II error
- ( ) Standard error

To build a bridge across a deep canyon, an engineer is interested in determining the distribution of random variable X, the maximum wind speed per day at the site. The population(s) of interest is _____ *

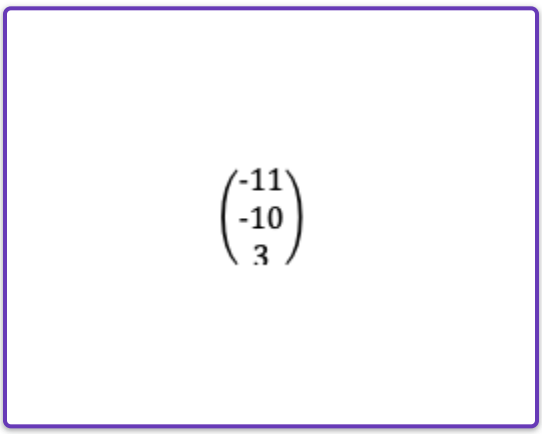
- ○ set of last seven days from past
- ○ statistical study is inappropriate
- ○ set of any 30 days
- ◉ Set of all days from past, present and future

If X is uniformly distributed over (0, 10), probability that 3<x<8 is ____ *

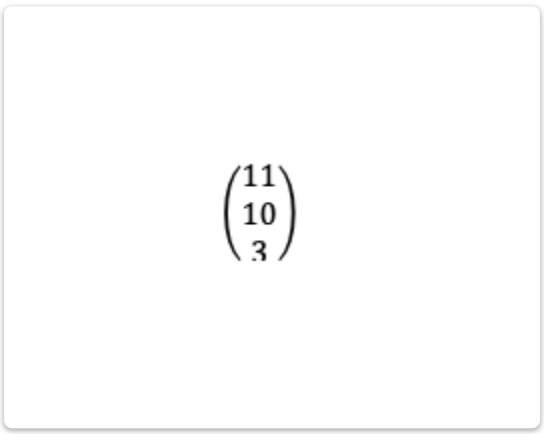
- ○ 3/10
- ○ 4/10
- ○ 2/10
- ○ 1/10
- ◉ 5/10

*

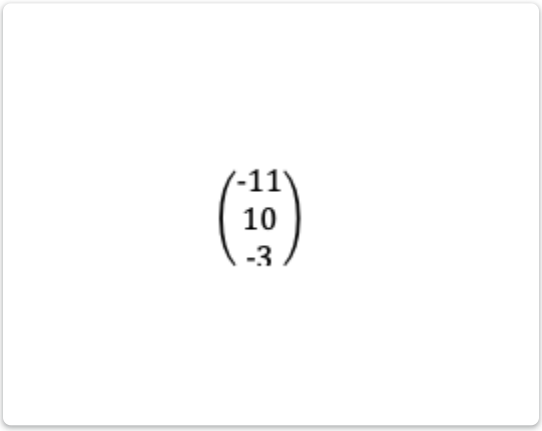
Let $A = \begin{pmatrix} 1 & -1 & 4 \\ 2 & -2 & 4 \\ 3 & -3 & 0 \end{pmatrix}$, -1 is an eigen value of A. Which of the following vector is an eigen vector of A corresponding to -1?



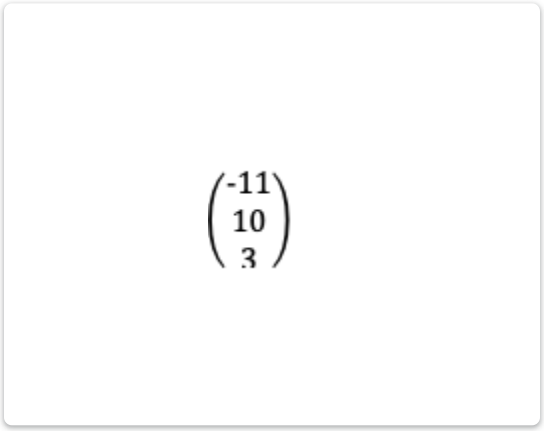
Option 1



Option 2



Option 3



Option 4

*

Identify the correct option for a backward variable

(a) $\beta_t(i) = P(O_1\ O_2 \ldots O_t, q_t = S_i \mid \lambda)$

(b) $\beta_t(i) = P(O_1\ O_2 \ldots O_t, q_{t+1} = S_i \mid \lambda)$

(c) $\beta_t(i) = P(O_{t+1}\ O_{t+2} \ldots O_T, q_t = S_i \mid \lambda)$

(d) $\beta_t(i) = P(O_{t+1}\ O_{t+2} \ldots O_T, q_{t+1} = S_i \mid \lambda)$

- ○ (a)
- ○ (b)
- ◉ (c)
- ○ (d)

*

Consider the following linear system

$$x + 2y - 3z = a$$
$$2x + 3y + 3z = b$$
$$5x + 9y - 6z = c$$

Which condition a, b & c must satisfy in order the system of equations is consistent?

$7a-b-c = 0$

Option 1

$3a + b-c = 0$

Option 2

$3a-b + 2c = 0$

Option 3

$7a-b + c = 0$

Option 4

*

Which of the following integer satisfying the following three congruences-

$x \equiv 2 \pmod 5$, $x \equiv 3 \pmod 7$, $x \equiv 4 \pmod{11}$

- [ ] 370
- [ ] 376
- [x] 367
- [ ] 368

*

Which of the linear Diophantine equation has solution?

$11x-33y = 100$

Option 1

$12x + 501y = 1$

Option 2

$8x + 64y = 24$

Option 3

$18x + 9y = 25$

Option 4

Let X be a Poisson random variable with parameter k=1/2 , then P[X>0] is *

- ○ Approximately 0
- ○ Approximately 1
- ○ 1
- ○ Approximately 0.51
- ○ doesn't exist
- ◉ Approximately 0.39

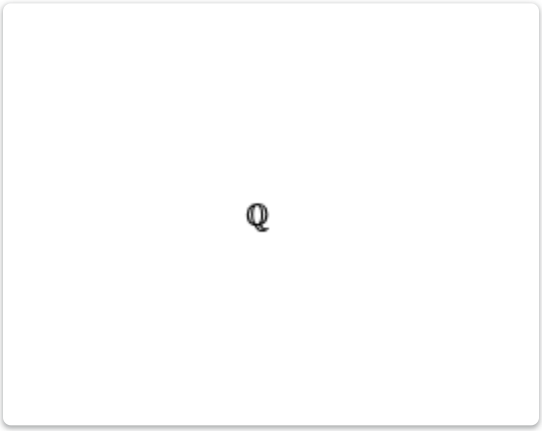
*

What is the Remainder when 3^{256} is divided by 5

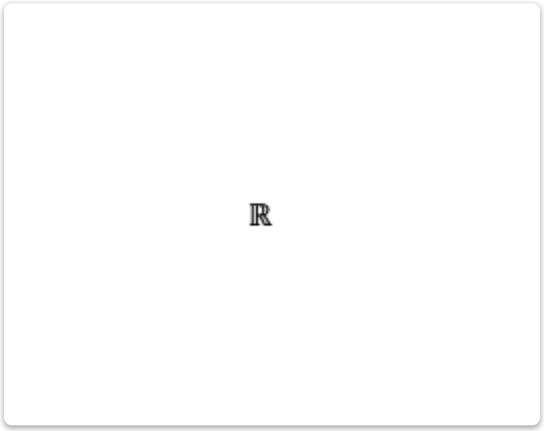
- ◉ 1
- ○ 3
- ○ 4
- ○ 2

*

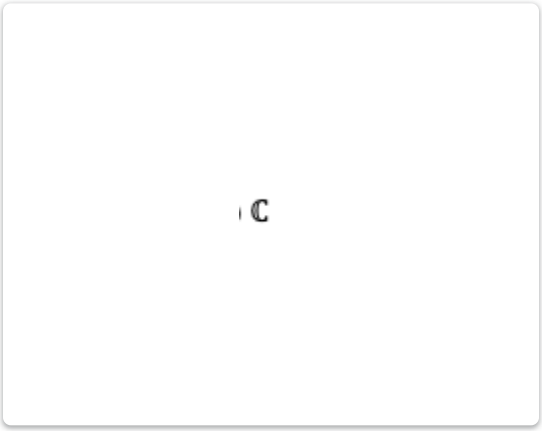
Which of the following set is not field with respect to usual addition and multiplication?



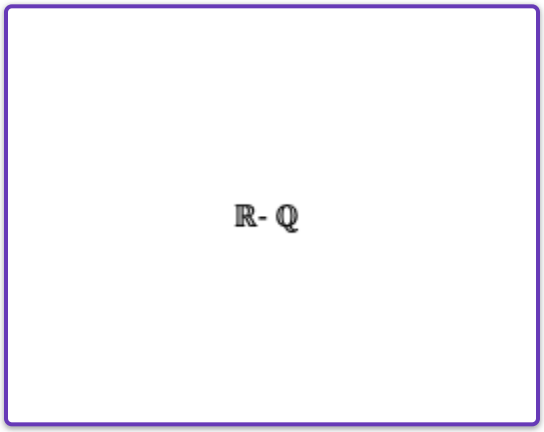
Option 1



Option 2



Option 3



Option 4

*

Identify the correct option for an forward variable

(a) $\alpha_t(i) = P(O_1\ O_2 \ldots O_t, q_t = S_i \mid \lambda)$

(b) $\alpha_t(i) = P(O_1\ O_2 \ldots O_t, q_{t+1} = S_i \mid \lambda)$

(c) $\alpha_t(i) = P(O_{t+1}\ O_{t+2} \ldots O_T, q_t = S_i \mid \lambda)$

(d) $\alpha_t(i) = P(O_{t+1}\ O_{t+2} \ldots O_T, q_{t+1} = S_i \mid \lambda)$

- [x] (a)
- [ ] (b)
- [ ] (c)
- [ ] (d)

The sample mean and sample median for the data set given below is ____ and _____ respectively. Data: 1 2 1 2 5 5 4 2 5 1 5 3 *

- [ ] 3, 3
- [ ] 3.2, 2
- [x] 3, 2.5
- [ ] 2.5, 3
- [ ] 3.2, 2.5
- [ ] 2.5, 3.2

From the data, the regression line of y on x is _____ (X, Y): (1, 1) (2, 3) (4, 4) (4,6) (5, 8) (7, 9) (8, 11) (9, 14) *

- [x] 2y = -1+3x
- [ ] 2y= 3-x
- [ ] none
- [ ] 11y= 6+7x
- [ ] 11y= 7+6x

*

If (a, 7)=1, then a^{12}-1 is divisible by R, where R is

- [ ] 3
- [x] 7
- [ ] 5
- [ ] 8

Let X1, X2, X3, X4, X5 be a random sample from a Binomial distribution with n=10 and p unknown. Estimate of p based on the data: 3, 4, 4, 5, 6 is _____ *

- [ ] 0.33
- [x] 0.44
- [ ] 0.22
- [ ] can't be estimated
- [ ] 0.11

*

Which of the following set is not vector space over the field $\mathbb{R}$?

$\mathbb{R}$

Option 1

$\mathbb{C}$

Option 2

$\mathbb{Q}$

Option 3

$\mathbb{R}^n$ or $\mathbb{C}^n$

Option 4

*

Identify the correct option for representing the state transition probability

(a) $a_{ij} = P(q_t = S_i \mid q_{t-1} = S_j)$

(b) $a_{ij} = P(q_t = S_j \mid q_{t-1} = S_i)$

(c) $a_{ij} = P(q_{t-1} = S_j \mid q_t = S_i)$

(d) $a_{ij} = P(q_{t-1} = S_i \mid q_t = S_j)$

- (a)
- (b)
- (c)
- (d)

When variance of population is unknown, the interval estimation of population mean is done from ___ *

- t-distribution
- Chi Squared distribution
- Normal distribution
- F distribution

*

The computational complexity to calculate P(O| λ) with N number of states and T number of sequence observations is

(a) NT

(b) T * logN

(c) N^2T

(d) NT^2

- (a)
- (b)
- (c)
- (d)

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