$$e^0 = \_\_\_\_$$

Q2

$$e^3 \times e^4 = e^{(\_\_\_\_)}$$

Q3

$$2 = log_{10}x$$

$$x = \_\_\_\_$$

Q4

$$log_{10}2 + log_{10}3$$

$$= log_{10}(\_\_\_\_)$$

Q5

$$\sum_{i=1}^{4} i = \_\_\_\_$$

Q1

$$I_{2\times 2} = \_\_\_\_$$

Q2

$$\begin{bmatrix}1 & 2\end{bmatrix}\begin{bmatrix}3\\4\end{bmatrix} = \_\_\_\_$$

Q3

$$\begin{bmatrix}3\\4\end{bmatrix}\begin{bmatrix}1 & 2\end{bmatrix} = \_\_\_\_$$

Q4

$$\begin{bmatrix}1 & 0\\0 & 2\end{bmatrix}\begin{bmatrix}0 & 2\\1 & 0\end{bmatrix} = \_\_\_\_$$

Q5

$$\begin{bmatrix}\frac{1}{2} & 0 & 0\\0 & \frac{1}{3} & 0\\0 & 0 & \frac{1}{4}\end{bmatrix}^{-1} = \_\_\_\_$$

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Q1

Question: Explain the concept of the elbow method in the context of K-Means clustering. What does it help us determine, and how is it useful in selecting the optimal number of clusters?

a) It helps in calculating distances between clusters.
b) It helps in selecting the initial centroids.
c) It helps in determining the optimal number of clusters.
d) It helps in minimizing the within-cluster sum of squares.

Q2

Question: What is the significance of eigenvectors in Principal Component Analysis (PCA)? How are they related to the principal components, and why are they important in dimensionality reduction?

a) Eigenvectors represent the original features.
b) Eigenvectors determine the amount of explained variance.
c) Eigenvectors are the principal components.
d) Eigenvectors represent the direction of maximum variance.

Q3

Question: In the context of linear regression, what is the coefficient of determination, often denoted as R-squared, used for?

a) Measuring the model's goodness of fit
b) Calculating the slope of the regression line
c) Evaluating multicollinearity
d) Normalizing the data

Q4

Question: What is the primary objective of the K-Means algorithm?

a) Clustering
b) Regression
c) Classification
d) Dimensionality Reduction

Q5

Question: What is the main goal of Principal Component Analysis (PCA) in Machine Learning?

a) Feature Scaling
b) Dimensionality Reduction
c) Feature Selection
d) Data Imputation

Q1

Question: If the logit value is 0, what is the value of the logistic sigmoid value? (Answer in one decimal)

Q2

Question: If the logit value is 3, what is the value of the log-odds?

Q3

Question: Given a single predictor $x = 3$, if the logistic regression model produces parameter $\theta_0 = -4$ and $\theta_1 = 1$, what is the predicted label given that the label for the positive class is 1 and 0 otherwise?

Q4

Question: Given vector $\vec{u} = \begin{bmatrix}1\\3\end{bmatrix}$ and $\vec{w} = \begin{bmatrix}2\\4\end{bmatrix}$, what is the value of $\vec{u}^T\vec{w}$?

Q5

Question: Given feature vector (input data vector) $\vec{x} = \begin{bmatrix}2\\4\end{bmatrix}$ and model parameter vector $\vec{\theta} = \begin{bmatrix}3\\6\\5\end{bmatrix}$, what is the value of the logit?