Q1
1 Point

What is the maximum number of eigenvectors for a matrix with dimensions 4×5?

- ○ 4
- ○ 5
- ○ 20
- ◉ 0

Q2
1 Point

What is the maximum rank for a matrix with dimensions 4×5?

- ◉ 4
- ○ 5
- ○ 20
- ○ 0

Q3
1 Point

Which of the following values of a would make the matrix

$$\begin{pmatrix} 1 & 1 & 3 \\ -1 & -1 & 2 \\ 2 & 2 & a \end{pmatrix}$$

full rank?

(*Check all that are correct.*)

- ☑ 5
- ☐ 6
- ☐ -4
- ☑ 0

Q4
1 Point

The union of two sets is the set of all points that are in **either** of the two sets. Is the union of two convex sets also a convex set?

- ○ Yes
- ⊙ No

Q5
1 Point

Are the vectors $\begin{pmatrix}3\\2\end{pmatrix}$, $\begin{pmatrix}-1\\0\end{pmatrix}$, and $\begin{pmatrix}1\\-1\end{pmatrix}$ a basis?

- ○ Yes
- ⊙ No

Q6
1 Point

The vector $\begin{pmatrix}3\\2\end{pmatrix}$ can be decomposed as $-\frac{1}{3}\begin{pmatrix}1\\-1\end{pmatrix}+\frac{5}{3}\begin{pmatrix}x\\1\end{pmatrix}$.

The value of x is 2

Q7
1 Point

Let $\mathbf{A}$ be an 5×5 matrix with rank 4. How many solutions are there to the **homogeneous** system of equations $\mathbf{Ax} = \mathbf{0}$?

- ○ 0
- ○ 1
- ⊙ infinitely many
- ○ not enough information

Q8
1 Point

Let $\mathbf{A}$ be an 5×5 matrix with rank 4. How many solutions are there to the **inhomogeneous** system of equations $\mathbf{Ax} = \mathbf{b}$?

- ○ 0
- ○ 1
- ○ infinitely many
- ⊙ not enough information

Q9
1 Point

The dot product between any two eigenvectors is zero.

- ○ True
- ⊙ False

Q10
1 Point

The multivariate Newton's method will terminate at a local maximum, minimum, or inflection point.

- ⊙ True
- ○ False