

Week 5 Day 1

Comfort Food

Make sure you know your neighbors' names. Then take about 2 minutes to discuss:

Do you have a go-to comfort food? If so, what is it? If not, do you have some other go-to comfort activity?

Bases

1. Let $\mathbf{u} = (1, 1)$. For which of the following vectors \mathbf{v} is it the case that $\{\mathbf{u}, \mathbf{v}\}$ is a basis for \mathbb{R}^2 ?

(A) $\mathbf{v} = (1, -1)$.

(B) $\mathbf{v} = (0, 1)$.

(C) $\mathbf{v} = (1, 0)$.

(D) None of the above OR more than one of the above.

2. Let

$$U = \left\{ \begin{bmatrix} a \\ a + b \\ b \end{bmatrix} : a, b \text{ real} \right\}.$$

What is $\dim(U)$?

- (A) 1
- (B) 2
- (C) 3
- (D) None of the above

3. Let

$$A = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}.$$

What is the dimension of the null space of A ?

(A) 1

(B) 2

(C) 3

(D) None of the above

Follow-up. What is the dimension of the column space of A ?