Assignment WW-Lin1nd

1. (1 point)

Let $A = \begin{bmatrix} -2 \\ 4 \\ -5 \end{bmatrix}$, $B = \begin{bmatrix} 4 \\ -9 \\ 12 \end{bmatrix}$, and $C = \begin{bmatrix} 2 \\ -5 \\ 6 \end{bmatrix}$.

[?] 1. Determine whether or not the three vectors listed above are linearly independent or linearly dependent.

If they are linearly dependent, determine a non-trivial linear relation. Otherwise, if the vectors are linearly independent, enter 0's for the coefficients, since that relationship **always** holds.

_____$A+$ _____$B+$ _____$C = 0$.

Correct Answers:

- LINEARLY_INDEPENDENT
- 0; 0; 0

2. (1 point) Are the vectors $\begin{bmatrix} 0 \\ 2 \\ -1 \end{bmatrix}$, $\begin{bmatrix} -1 \\ -1 \\ 4 \end{bmatrix}$ and $\begin{bmatrix} -3 \\ 3 \\ 3 \end{bmatrix}$ linearly independent?

- Choose
- linearly dependent
- linearly independent

If they are linearly dependent, find scalars that are not all zero such that the equation below is true. If they are linearly independent, find the only scalars that will make the equation below true.

$$\_\_\_ \begin{bmatrix} 0 \\ 2 \\ -1 \end{bmatrix} + \_\_\_ \begin{bmatrix} -1 \\ -1 \\ 4 \end{bmatrix} + \_\_\_ \begin{bmatrix} -3 \\ 3 \\ 3 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}.$$

Correct Answers:

- linearly independent
- 0; 0; 0

3. (1 point) Let $S = \{r, u, d, x\}$ be a set of vectors.

If $x = 4r + u + 5d$, determine whether or not S is linearly independent.

[?] 1. Determine whether or not the four vectors listed above are linearly independent or linearly dependent.

If S is dependent, enter a non-trivial linear relation below. Otherwise, enter 0's for the coefficients.

_____$r+$ _____$u+$ _____$d+$ _____$x = 0$.

Correct Answers:

- LINEARLY_DEPENDENT
- 4; 1; 5; -1

4. (1 point) Suppose $S = \{r, u, d\}$ is a set of linearly independent vectors.

If $x = 2r + 2u + 5d$, determine whether $T = \{r, u, x\}$ is a linearly independent set.

[?] 1. Is T linearly independent or dependent?

If T is dependent, enter a non-trivial linear relation below. Otherwise, enter 0's for the coefficients.

_____ $r+$ _____ $u+$ _____ $x = 0$.

Correct Answers:

- LINEARLY_INDEPENDENT
- 0; 0; 0