1) L.D is always defined for set of vectors.

2) If atleast one vector can be represented as a linear combination of the other vectors, then the set of vectors is L.D.

*3) A set containing a "zero vector" is always L.D.

$\left\{ \begin{bmatrix} 0 \\ 0 \end{bmatrix} \right\} \rightarrow$ L.D

$\left\{ \begin{bmatrix} 1 \\ 2 \end{bmatrix} \right\} \rightarrow$ Can't Determine

TRUE/FALSE

i) A set containing a single non-zero vector is always linearly dependent.

$\left\{ \begin{bmatrix} 2 \\ 3 \end{bmatrix} \right\}$ (FALSE)

ii) A set containing a single zero vector is always linearly dependent.

$\left\{ \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \right\}$ (TRUE)

MathsForFun

(TRUE | FALSE)

1. *Two vectors are linearly dependent if and only if they are collinear, i.e., one is a scalar multiple of the other.* (TRUE)
2. *Any set containing the zero vector is linearly dependent.* (TRUE)
3. *If a subset of* $\{v_1, v_2, \ldots, v_k\}$ *is linearly dependent, then* $\{v_1, v_2, \ldots, v_k\}$ *is linearly dependent as well.* (TRUE)

(1) $\left\{ \begin{bmatrix} 1 \\ 4 \end{bmatrix}, \begin{bmatrix} 3 \\ 12 \end{bmatrix} \right\} \rightarrow \begin{bmatrix} 3 \\ 12 \end{bmatrix} = 3 \begin{bmatrix} 1 \\ 4 \end{bmatrix}$

LD

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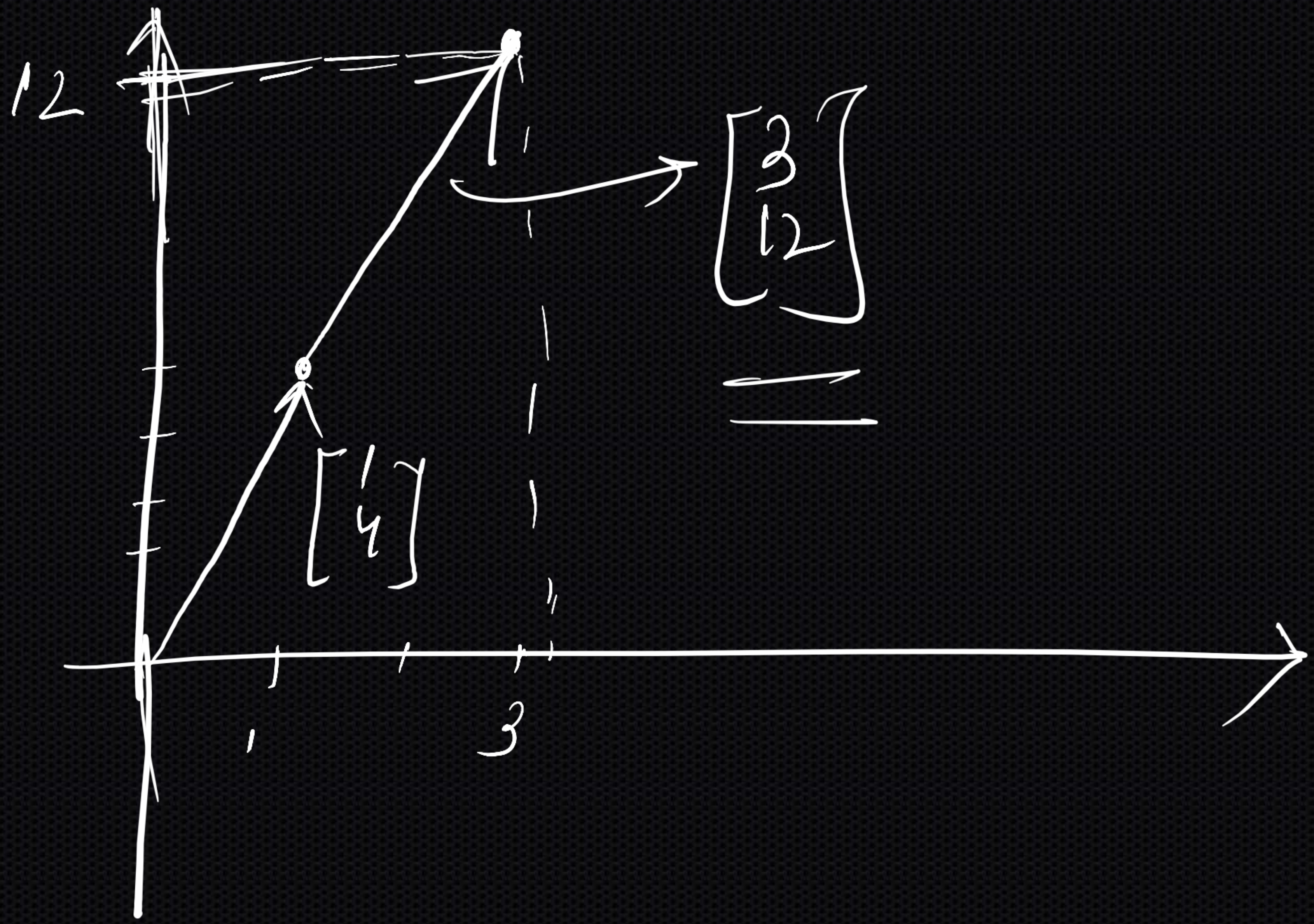
12
1
3
$\begin{bmatrix}1\\4\end{bmatrix}$
$\begin{bmatrix}3\\12\end{bmatrix}$

MathsForFun

Let $K = 4$: Set $= \{v_1, v_2, v_3, v_4\} = A$

$B = \{v_1, v_2, v_3\}$ $[B \subseteq A]$

$\to$ L.D.

$[v_3 = c_1 v_1 + c_2 v_2]$

$v_3 = c_1 v_1 + c_2 v_2 + (0) v_4$

$\neq 0$

CONCEPT: → If a set is LD, then its' Superset is always LD.

✗ → If a set is LD, then its' Subset may or may not be LD.