Let v_j's be the vectors in R^n for j = 1,2,3,4.
Which of the following is/are CORRECT ?

A) If $\{v_1,v_2,v_3,v_4\}$ is linearly dependent, so is $\{v_1,v_2,v_3\}$.

B) If $\{v_1,v_2,v_3\}$ is linearly dependent, so is $\{v_1,v_2,v_3,v_4\}$.

C) $\{v_1,v_2,v_3,v_4\}$ is linearly dependent iff, atleast one vector from the given set is a linear combination of the other vectors, other than itself.

D) A set containing zero vector is always linearly dependent. (Always CORRECT)

$\{v_1, v_2, v_3, v_4\} \in \mathbb{R}^n$.

A) $\{v_1, v_2, v_3, v_4\} \rightarrow$ Linearly dependent:

$\{v_1, v_2, v_3\} \longrightarrow$ L.D?? (NOT GUARANTEE)

$v_4 = c_1 v_1 + c_2 v_2 + c_3 v_3$

$v_1 \neq$ L.C of (v_2, v_3, v_4)

$v_2 \neq$ L.C of (v_1, v_3, v_4)

$v_3 \neq$ L.C of (v_1, v_2, v_4)

NOTE: If a set of vector is L.D, then its' subset may or may not be L.D.

(a) $\{v_1, v_2, v_3\} \rightarrow$ L.D.

$v_2 = c_1 v_1 + c_3 v_3$.

$\{v_1, v_2, v_3, v_4\}$: $v_2 = c_1 v_1 + c_3 v_3 + (0) v_4$

↳ L.D (always)

NOTE: If a set of vectors is L.D, then its Superset is always L.D.

c) $\{v_1, v_2, v_3, v_4\} \rightarrow$ LD

$v_4 = c_1 v_1 + c_2 v_2 + c_3 v_3$ (✓)

$v_4 = c_1 v_1 + c_2 v_2 + c_3 v_3 + c_4 v_4$ (✗)