Step-1

a)

The four vectors are dependent.

Because, the four vectors are columns of a 3 by 4 matrix. A with at least one free variable. So $Ax = 0\backslash$

Step-2

b)

The two vectors v_1 and v_2 will be dependent if $[v_1 \quad v_2]$ matrix has rank 0 or 1 but not 2.

Or

The two vectors v_1 and v_2 will be dependent if $v_1 = tv_2$ for some non-zero scalar t.

Step-3

c)

The vectors v_1 and $(0,0,0)$ are dependent because $(-2)(0,0,0)+(0)v_1 = 0$