FIND THE VALUES OF x, if any, for which the vectors
$$x_1 = (1, 3, 4), \quad x_2 = (2, -1, 1), \quad x_3 = (1, x, 2x)$$
Are linearly dependent. $n = k = 3$

$$\det A = \begin{vmatrix} 1 & 2 & 1 \\ 3 & -1 & x \\ 4 & 1 & 2x \end{vmatrix} \xrightarrow[R_4 - 4R_1]{R_2 - 3R_1} \begin{vmatrix} 1 & 2 & 1 \\ 0 & -7 & x-3 \\ 0 & -7 & 2x-4 \end{vmatrix} = (1)^{1+1}(1) \begin{vmatrix} -7 & x-3 \\ -7 & 2x-4 \end{vmatrix}$$

$\Rightarrow -7(2x-4) - (-7)(x-3)$

$\Rightarrow -14x + 28 + 7x - 21$

$\Rightarrow 7x + 7 \quad \Rightarrow (-7)(x-1) \neq 0$

$\quad x \neq 1 \quad$ (for all x)