Volumes and determinants

1. a) Find the volume of the parallelepiped with edges given by the origin vectors $\langle 1, 2, 4\rangle$, $\langle 2, 0, 0\rangle$, $\langle 1, 5, 2\rangle$

$\begin{vmatrix} 1 & 2 & 4 \\ -2 & 0 & 0 \\ 1 & 5 & 2 \end{vmatrix} = -2(4-20) = 32$ unit^3

2. We know $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix} = 0.$

What does this say about the origin vectors $\langle 1, 2, 3\rangle$, $\langle 4, 5, 6\rangle$ and $\langle 7, 8, 9\rangle$?

the volume of parallelepiped with these vectors as edges is zero.

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