

Source: [KBe2020math530refExr0nRetIndex](#)

1 | Prompt

Which of the following systems have a unique solution? You do NOT have to solve the 3 variable system by hand; you can graph it or use other resources. What does this have to do with linearly dependent/independent vectors??

2 | Ideas

I first focused on the systems of 2 var 2 equs. I thought of the first set

$$\begin{aligned} 2x - 3y &= 1 \\ x + 3y &= 3 \end{aligned}$$

as asking

$$(1, 3) \stackrel{?}{\in} \text{span}((2, 1), (-, 31))$$

but that didn't really get me anywhere.

Then, I tried writing it as a matrix equation:

$$\begin{bmatrix} 2 & -3 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$$

I figured that because we wanted to know whether the system is linearly independent or not, which is a boolean value,
