Various Sneaky Mathematicians 1

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This activity builds on IOLA materials on introductory linear algebra, available here: `http://iola.math.vt.edu` and discussed here: `https://www.tandfonline.com/doi/abs/10.1080/10511970.2012.667516`.

Question 1

Old Man Gauss is back in $\mathbb{R}^2$ and hidden somewhere along the line $y = 7x - 23$. You have a brand new hoverboard and when you start it for the first time you must set the direction of travel (i.e. vector). Once the direction is set it cannot be changed without great difficulty (so you are stuck with the direction you choose). You also have a dodgy, enchanted portal that can take you to any point in $\mathbb{R}^2$, but you can only be confident it will work once.

1. How should you program your hoverboard and where should you take the portal to ensure you can find Old Man Gauss?

2. Ask your instructor to learn the exact point (x, y) where Old Man Gauss is hiding. Based on the point and direction you chose in (1), when will you reach Old Man Gauss?

Question 2

Unlike Old Man Gauss, Seki Takakazu has managed to hide in $\mathbb{R}^3$. He is at a point (x, y, z) that satisfies the equation $y = 7x - 23$.

1. Can you reach Seki with the hoverboard and portal you had from Question 1? If your answer is yes, show why this is true. If your answer is no, what other transport would you need to reach Seki?