

THE CARPET RIDE PROBLEM: HIDE AND SEEK

Name _____ Group Members _____

You are a young traveler, leaving home for the first time. Your parents want to help you on your journey, so just before your departure, they give you two gifts. Specifically, they give you two forms of transportation: a hover board and a magic carpet. Your parents inform you that both the hover board and the magic carpet have restrictions in how they operate:



We denote the restriction on the *hover board's* movement by the vector $\begin{bmatrix} 3 \\ 1 \end{bmatrix}$.

By this we mean that if the hover board traveled “forward” for one hour, it would move along a “diagonal” path that would result in a displacement of 3 units East and 1 unit North of its starting location.



We denote the restriction on the *magic carpet's* movement by the vector $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$.

By this we mean that if the magic carpet traveled “forward” for one hour, it would move along a “diagonal” path that would result in a displacement of 1 unit East and 2 units North of its starting location.

SCENARIO TWO: HIDE-AND-SEEK

Old Man Gauss wants to move to a cabin in a different location. You are not sure whether Gauss is just trying to test your wits at finding him or if he actually wants to hide somewhere that you can't visit him.

Are there some locations that he can hide and you cannot reach him with these two modes of transportation?

Describe the places that you can reach using a combination of the hover board and the magic carpet and those you cannot. Specify these geometrically and algebraically. Include a symbolic representation using vector notation. Also, include a convincing argument supporting your answer.

Use your group's whiteboard as a space to write out our work as you work together on this problem.