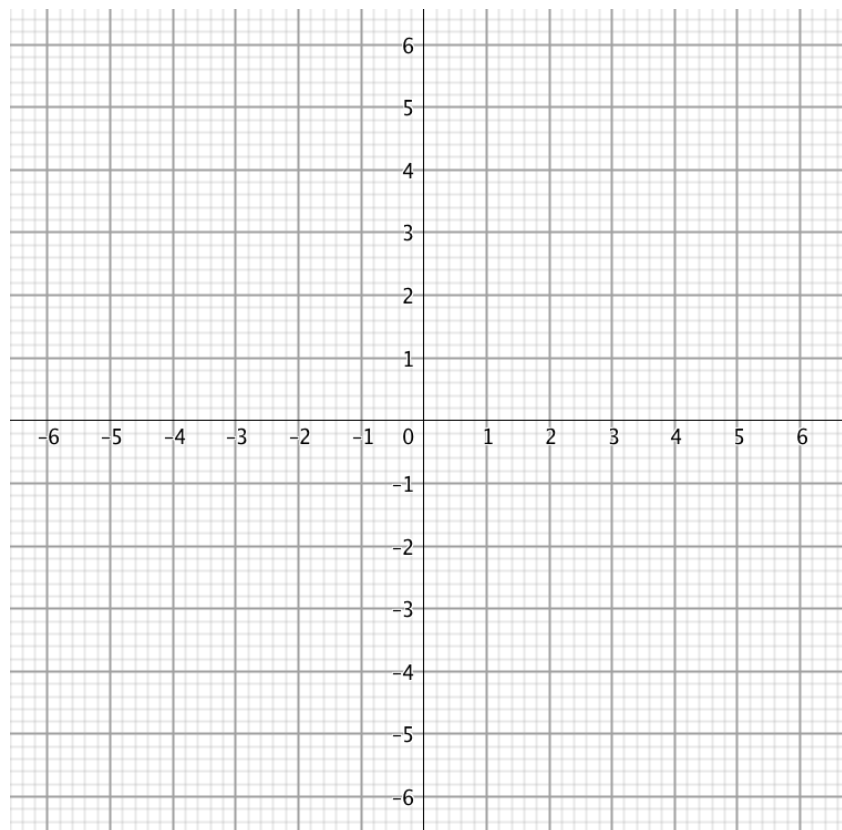


1. Within the xy plane, sketch vectors $\mathbf{a} = \langle 1, 2 \rangle$ and $\mathbf{b} = \langle 2, 1 \rangle$.



2. Draw the vector \mathbf{v} going from the head of vector \mathbf{a} to the head of vector \mathbf{b} . Using the head-to-tail definition of adding geometric vectors, write a vector equation using these three vectors, then solve the equation for vector \mathbf{v} .
3. Draw the following vectors on the xy plane: $\mathbf{a} + \mathbf{v}$, $\mathbf{a} + 0.5\mathbf{v}$, $\mathbf{a} - 0.5\mathbf{v}$, $\mathbf{a} - \mathbf{v}$, $\mathbf{a} + 2\mathbf{v}$. What do you notice about the heads of all these vectors?
4. As the number t varies over all possible values, what can you say about the head of the vector $\mathbf{w} = \mathbf{a} + t\mathbf{v}$?
5. Generalizing, suppose $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$ are two points on a line. Find a “vector equation” (as in the previous problem) of the line through these two points.