

Vectors Whiteboard

1.

- On a piece of graph paper, draw the vector $\vec{f} = \langle -2, 4, 0 \rangle$, putting the tail of the vector at $\langle -3, 0, 0 \rangle$. Label the vector \vec{f} .
- Calculate the vector $2\vec{f}$, and draw this vector on the graph, putting its tail at $\langle -3, -3, 0 \rangle$, so you can compare it to the original vector. Label the vector $2\vec{f}$.
- How does the magnitude of $2\vec{f}$ compare to the magnitude of \vec{f} ?
- How does the direction of $2\vec{f}$ compare to the direction of \vec{f} ?
- Calculate the vector $\vec{f}/2$, and draw this vector on the graph, putting its tail at $\langle -3, -6, 0 \rangle$, so you can compare it to the other vectors. Label the vector $\vec{f}/2$.
- How does the magnitude of $\vec{f}/2$ compare to the magnitude of \vec{f} ?
- How does the direction of $\vec{f}/2$ compare to the direction of \vec{f} ?
- Does multiplying a vector by a scalar change the magnitude of the vector?
- The vector $a(\vec{f})$ has a magnitude three times as great as that of \vec{f} , and its direction is opposite to the direction of \vec{f} . What is the value of the scalar factor a ?

2.

- On a piece of graph paper, draw the vector $\vec{g} = \langle 4, 7, 0 \rangle$ m. Put the tail of the vector at the origin.
- Calculate the magnitude of \vec{g} .
- Calculate \hat{g} , the unit vector pointing in the direction of \vec{g} .
- On the graph draw \hat{g} . Put the tail of the vector at $\langle 1, 0, 0 \rangle$ m so you can compare \hat{g} and \vec{g} .
- Calculate the product of the magnitude $|\vec{g}|$ times the unit vector \hat{g} , $(|\vec{g}|)(\hat{g})$.