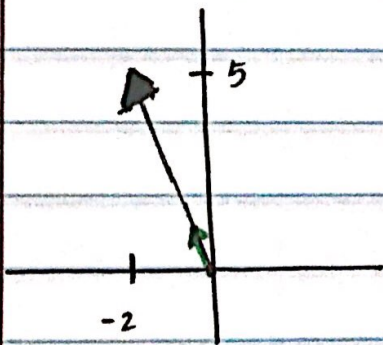


Unit Vectors

- vectors whose magnitude (length) is 1
- to create a unit vector, divide the vector by its magnitude

$$\text{unit vector} = \frac{\vec{v}}{\|\vec{v}\|}$$

ex: Find a unit vector in the direction of $\vec{v} = \langle -2, 5 \rangle$

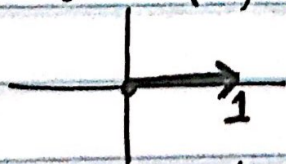


$$\|\vec{v}\| = \sqrt{29} \quad \text{unit vector} = \left\langle \frac{-2}{\sqrt{29}}, \frac{5}{\sqrt{29}} \right\rangle$$
$$\approx \langle -.37, .93 \rangle$$

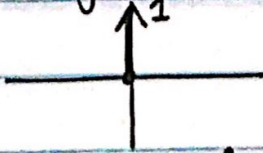
check: $\|\langle -.37, .93 \rangle\| = 1$

Any vector can be written as a linear combination of the unit vectors i and j .

$$i = \langle 1, 0 \rangle$$



$$j = \langle 0, 1 \rangle$$



write $\langle a, b \rangle$ as $ai + bj$

$$\text{ex: } \langle 2, -3 \rangle = 2i - 3j$$

$$\text{ex: } \langle 0, -5 \rangle = -5j$$