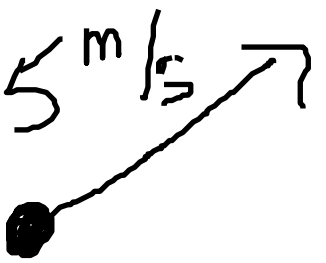
Hi! :)

Vectors

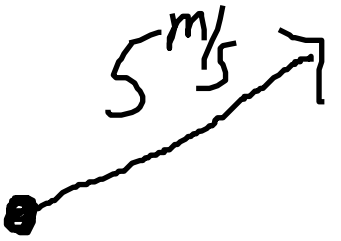
- direction
- magnitude
- units



$\vec{v}$

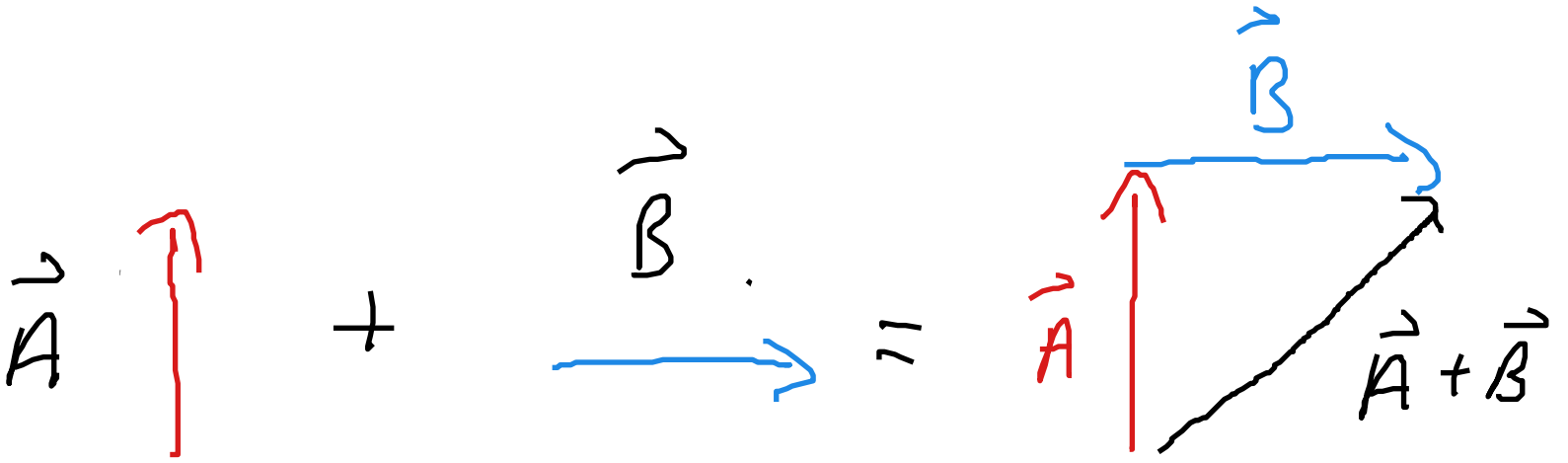
$|\vec{v}| = 5\ m/s$

$v = 5\ m/s$



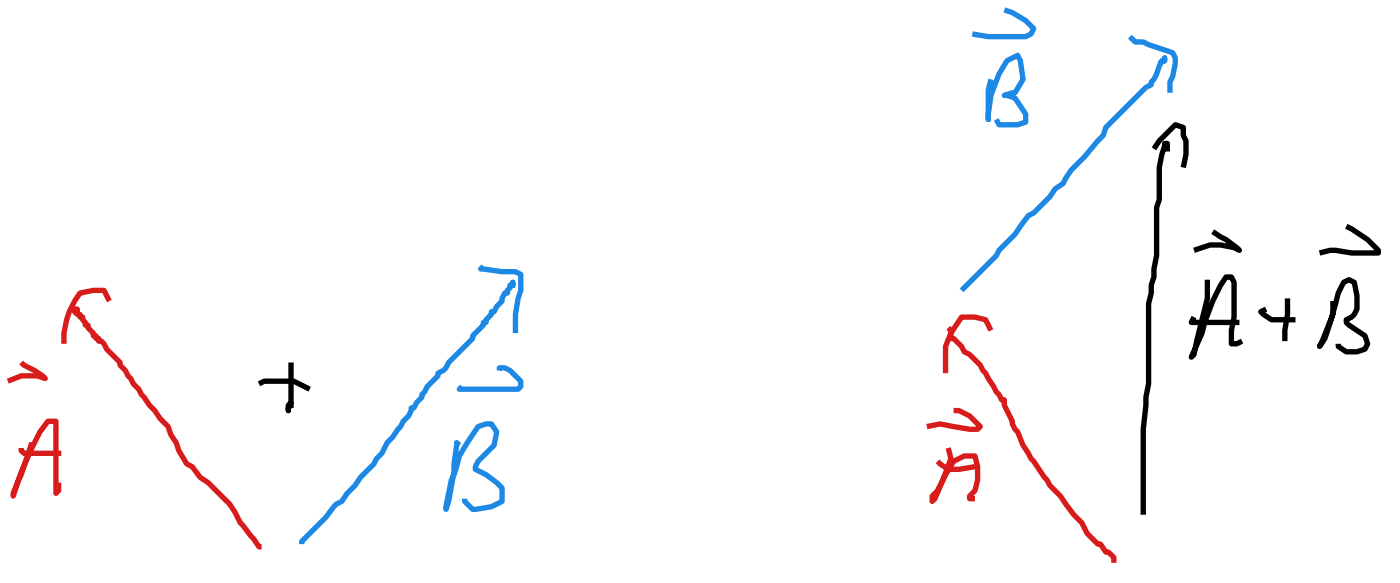
identical vectors

Add Vectors

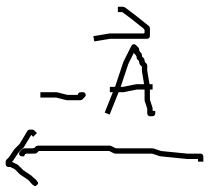


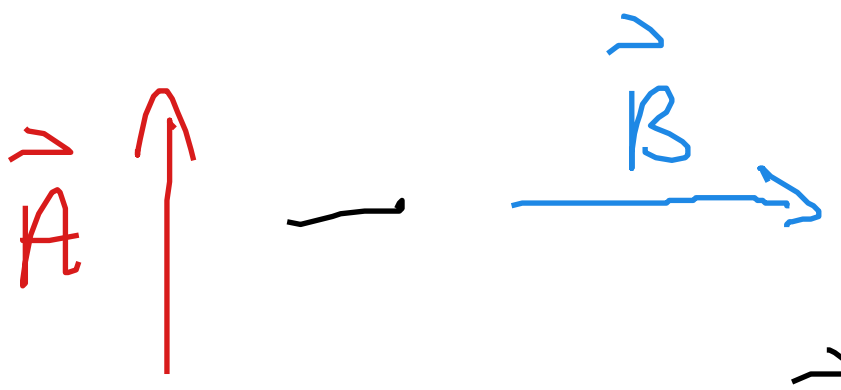
make a chain of vectors

sum is arrow from beginning to end of chain

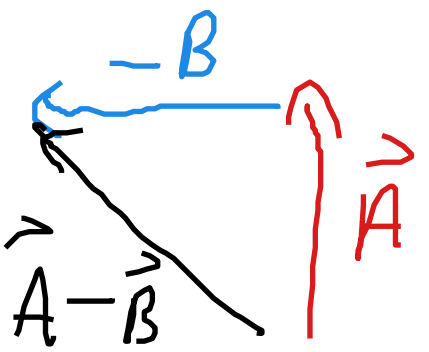


Multiply by a Scalar

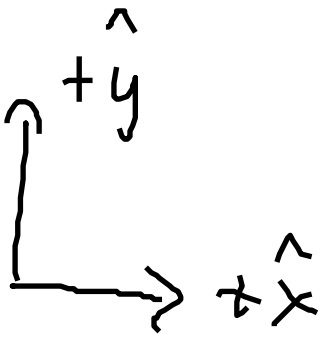




$$+(-1)\times\vec{B}$$



Coordinate Axis



$\hat{x}$: unit vector

$|\hat{x}| = 1$

$(5\ m/s)\ \hat{x}$

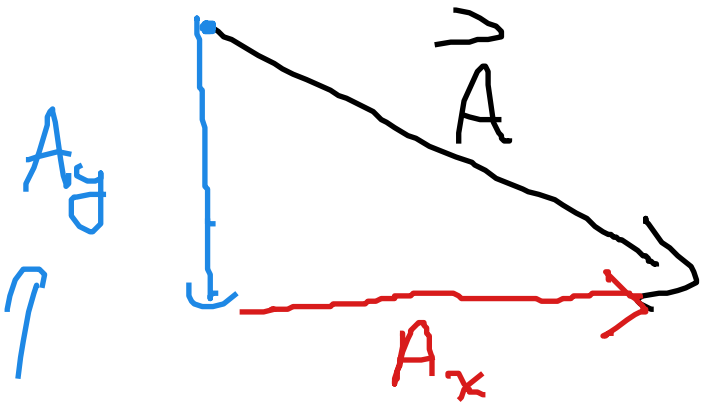
magnitude direction

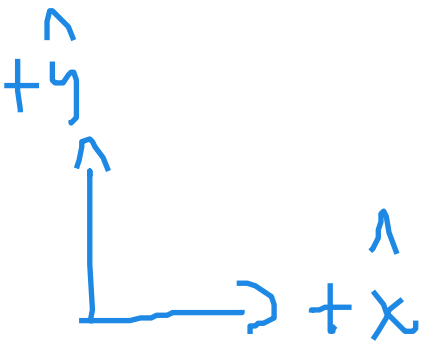
$(3m)(-\hat{y})$

Sign belongs to the direction

$-3m\ \hat{y}$

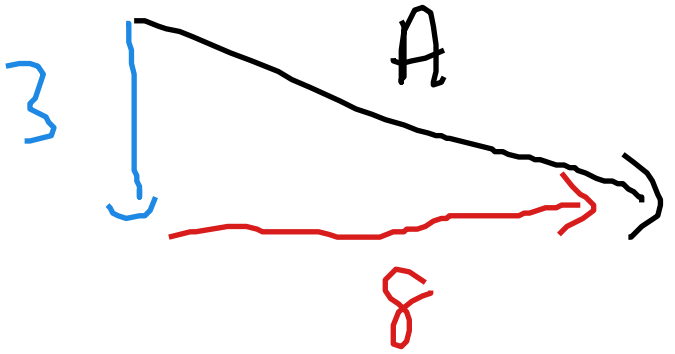
$-3\hat{y}\ m$





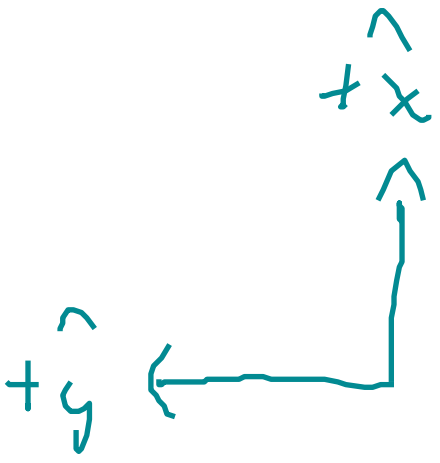
y component of $\vec{A}$

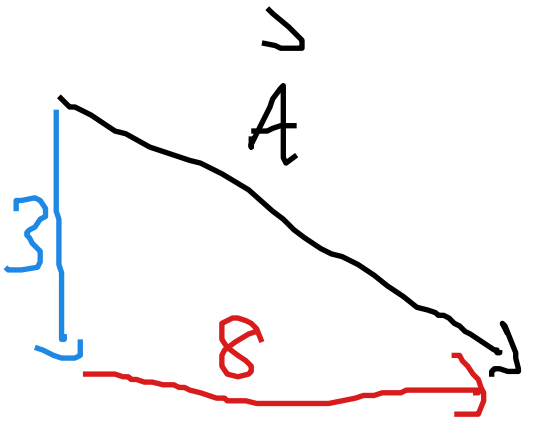
x component of $\vec{A}$



$$\vec{A} = +8\hat{x} - 3\hat{y}$$

$$+8\hat{x} + 3(-\hat{y})$$





$$\vec{A} = 3(-\hat{x}) + 8(-\hat{y})$$

Writing $\vec{A}$ in component form

Depends on your choice of coordinate axis

$8\hat{x} - 3\hat{y}$

$8\hat{i} - 3\hat{j}$

$\langle 8, -3 \rangle$

$$\vec{A} = 8\hat{x} - 3\hat{y}$$

$$\vec{B} = 2\hat{x} + \hat{y}$$

$$\vec{A} + \vec{B} = (8\hat{x} - 3\hat{y}) + (2\hat{x} + \hat{y})$$

$$= 8\hat{x} - 3\hat{y} + 2\hat{x} + \hat{y}$$

$$(8+2)\hat{x} + (-3+1)\hat{y}$$

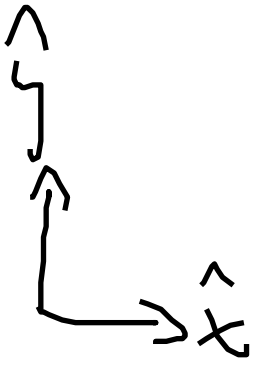
$$= 10\hat{x} - 2\hat{y}$$

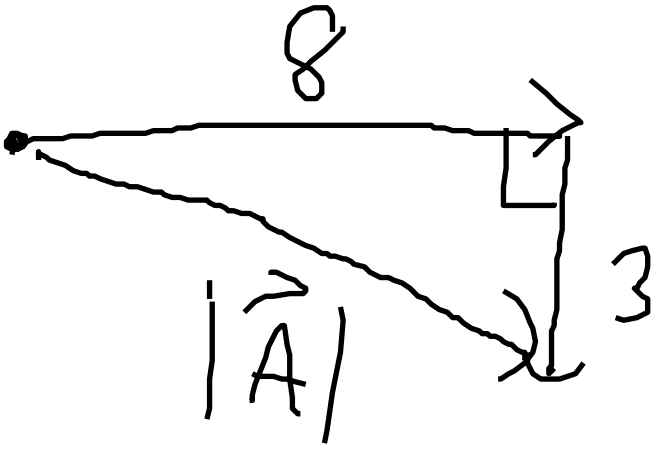
$$2\vec{A} + \vec{B} = 2(8\hat{x} - 3\hat{y}) + (2\hat{x} + \hat{y})$$

$$16\hat{x} - 6\hat{y} + 2\hat{x} + \hat{y} = 18\hat{x} - 5\hat{y}$$

$$\vec{A} = 8\hat{x} - 3\hat{y}$$

$|\vec{A}|$

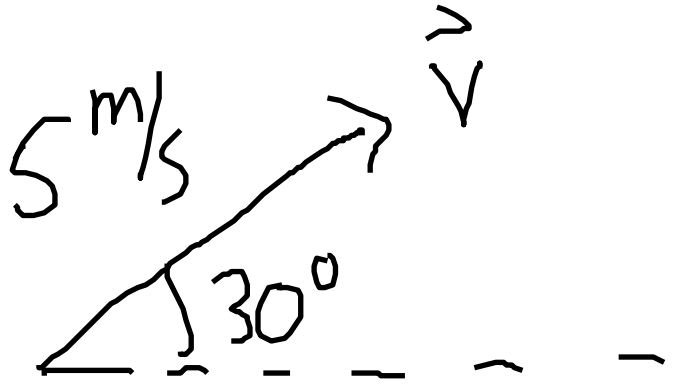


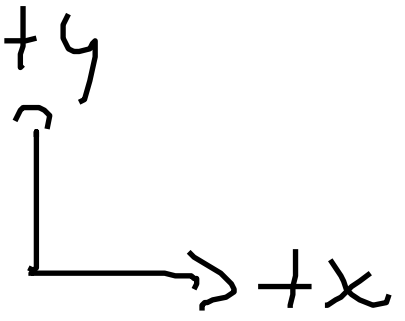


$$|\vec{A}| = \sqrt{(8)^2 + (-3)^2}$$

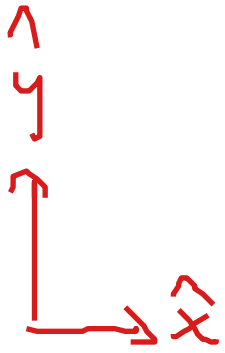
$$= \sqrt{64 + 9}$$

$$= \sqrt{73} = 8.5$$





$$\vec{V} = +5\cos 30^0\,\hat{x} + 5\sin 30^0\,\hat{y}$$



$$\vec{A} = +4\sin 20^0\,\hat{x} - 4\cos 20^0\,\hat{y}$$