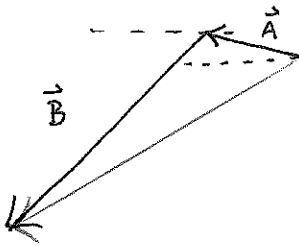


# Vector Addition Practice:

①  $\vec{A} = 220\text{km} [27^\circ \text{ above } -x]$ ;  $\vec{B} = 740\text{km} [39^\circ \text{ below } -x]$ ; Find  $\vec{C} = \vec{A} + \vec{B}$

sketch



$$\vec{A}_x = -220\text{km} \cos 27^\circ \hat{x}$$

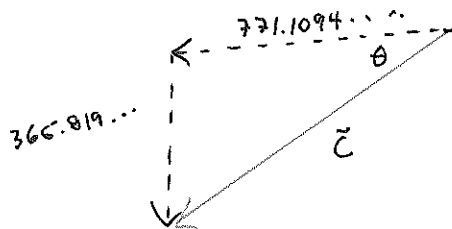
$$\vec{A}_y = 220\text{km} \sin 27^\circ \hat{y}$$

$$\vec{B}_x = -740\text{km} \cos 39^\circ \hat{x}$$

$$\vec{B}_y = -740\text{km} \sin 39^\circ \hat{y}$$

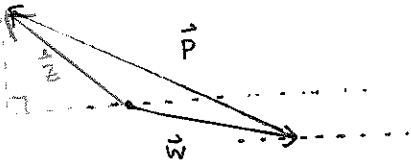
$$\vec{C}_x = \vec{A}_x + \vec{B}_x = -771.1094468\text{km}$$

$$\vec{C}_y = \vec{A}_y + \vec{B}_y = -365.8191794\text{km}$$



$$\vec{C} = 850\text{km} [25^\circ \text{ below } -x]$$

②  $\vec{W} = 0.055\text{T} [29^\circ \text{ below } +x]$ ;  $\vec{P} = 0.113\text{T} [34^\circ \text{ above } -x]$ ; Find  $\vec{Z} = \vec{W} + \vec{P}$



$$\vec{W}_x = +0.055\text{T} \cos 29^\circ$$

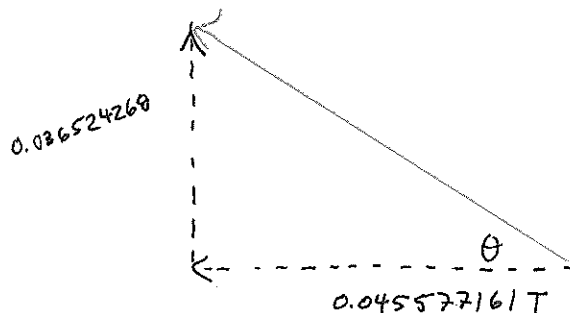
$$\vec{W}_y = -0.055\text{T} \sin 29^\circ$$

$$\vec{P}_x = -0.113\text{T} \cos 34^\circ$$

$$\vec{P}_y = +0.113\text{T} \sin 34^\circ$$

$$\vec{Z}_x = \vec{W}_x + \vec{P}_x = -0.045577161\text{T} \hat{x}$$

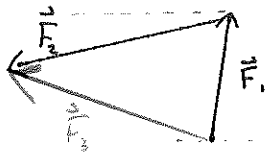
$$\vec{Z}_y = 0.036524268\text{T} \hat{y}$$



$$\vec{Z} = 0.058\text{T} [38^\circ \text{ above } -x]$$



3.  $\vec{F}_1 = 16\text{N} [81^\circ \text{ above } +x]$ ;  $\vec{F}_2 = 27\text{N} [23^\circ \text{ below } -x]$ ; Find  $\vec{F}_3 = \vec{F}_1 + \vec{F}_2$



$$F_{1x} = +16 \cos 81^\circ$$

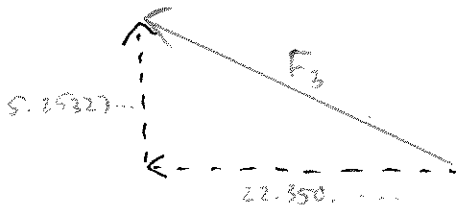
$$F_{1y} = +16 \sin 81^\circ$$

$$F_{2x} = -27 \cos 23^\circ$$

$$F_{2y} = -27 \sin 23^\circ$$

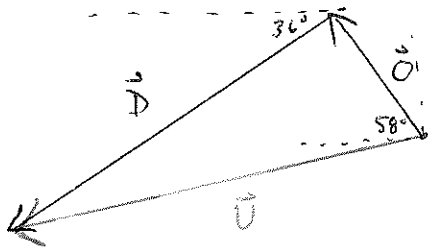
$$F_{3x} = F_{1x} + F_{2x} = -22.3506796\text{N} \hat{x}$$

$$F_{3y} = F_{1y} + F_{2y} = 5.25327298\text{N} \hat{y}$$



$$\vec{F}_3 = 23\text{N} [13^\circ \text{ above } -x]$$

4.  $\vec{O} = 19\text{m/s} [58^\circ \text{ N of W}]$ ;  $\vec{D} = 62\text{m/s} [36^\circ \text{ S of W}]$ ; Find  $\vec{U} = \vec{O} + \vec{D}$



$$O_x = -19 \cos 58^\circ$$

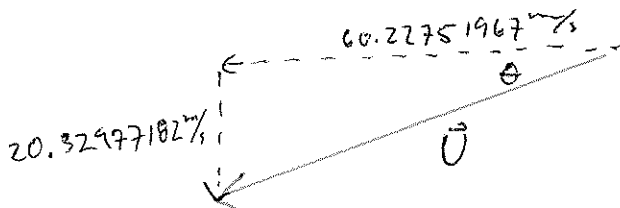
$$O_y = +19 \sin 58^\circ$$

$$D_x = -62 \cos 36^\circ$$

$$D_y = -62 \sin 36^\circ$$

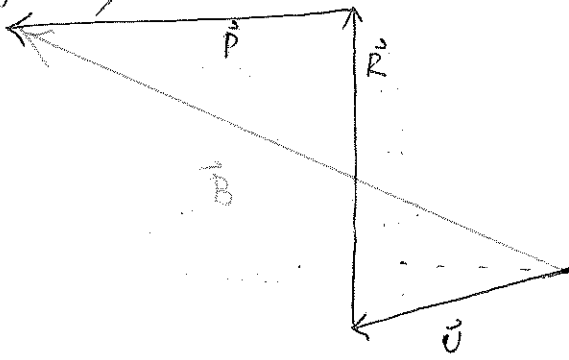
$$U_x = O_x + D_x = -60.22751967\text{m/s} \hat{x}$$

$$U_y = -20.32977182\text{m/s} \hat{y}$$



$$\vec{U} = 64\text{m/s} [19^\circ \text{ S of W}]$$

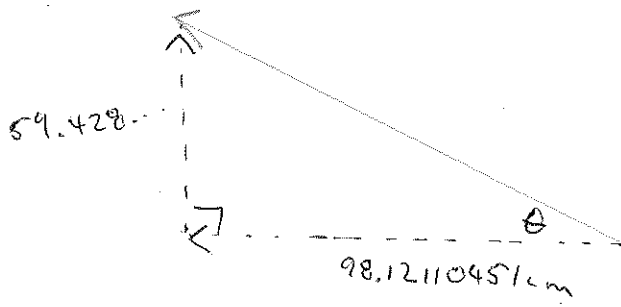
5)  $\vec{R} = 72 \text{ cm } \hat{y}$ ;  $\vec{U} = 43 \text{ cm } [17^\circ \text{ below } -x]$ ;  $\vec{P} = -57 \text{ cm } \hat{x}$ ; Find  $\vec{B} = \vec{U} + \vec{R} + \vec{P}$ .



$$\begin{aligned} \vec{U}_x &= -43 \cos 17^\circ \\ \vec{U}_y &= -43 \sin 17^\circ \\ \vec{R}_x &= 0 \\ \vec{R}_y &= 72 \text{ cm} \\ \vec{P}_x &= -57 \text{ cm} \\ \vec{P}_y &= 0 \end{aligned}$$

$$\vec{B}_x = \vec{U}_x + \vec{R}_x + \vec{P}_x = -98.12110451 \text{ cm } \hat{x}$$

$$\vec{B}_y = \vec{U}_y + \vec{R}_y + \vec{P}_y = 59.4280167 \text{ cm } \hat{y}$$



$$\vec{B} = 110 \text{ cm } [31^\circ \text{ above } -x]$$