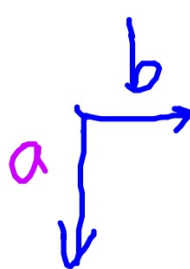
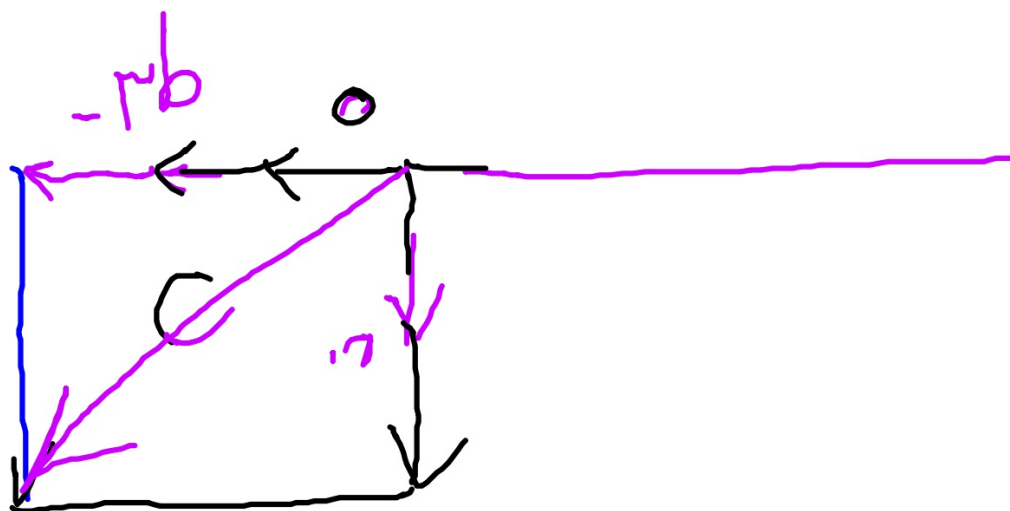


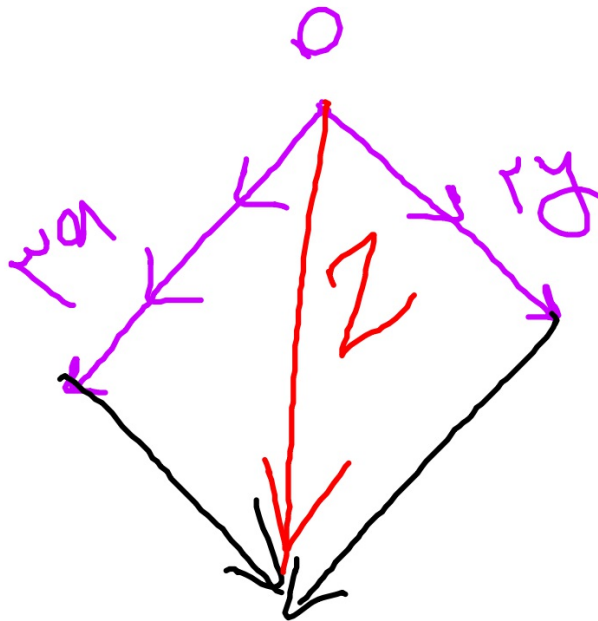
$c = r_a - r_b$



A small coordinate system diagram with a vertical arrow pointing downwards labeled 'a' and a horizontal arrow pointing to the right labeled 'b'.



$\vec{x}$ $\vec{y}$ $Z = r_x \vec{x} + r_y \vec{y}$

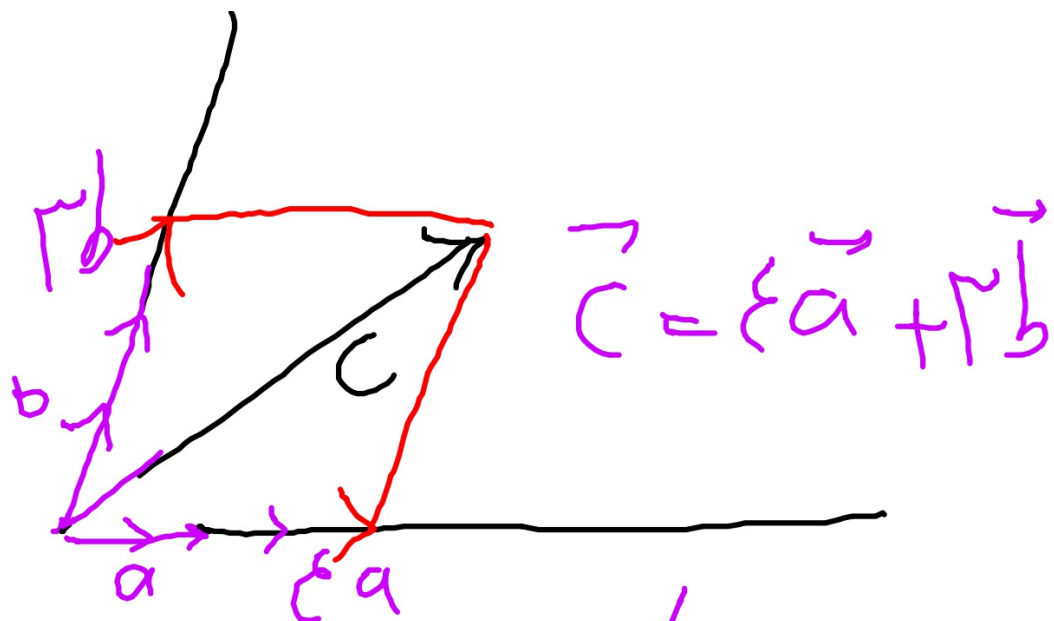


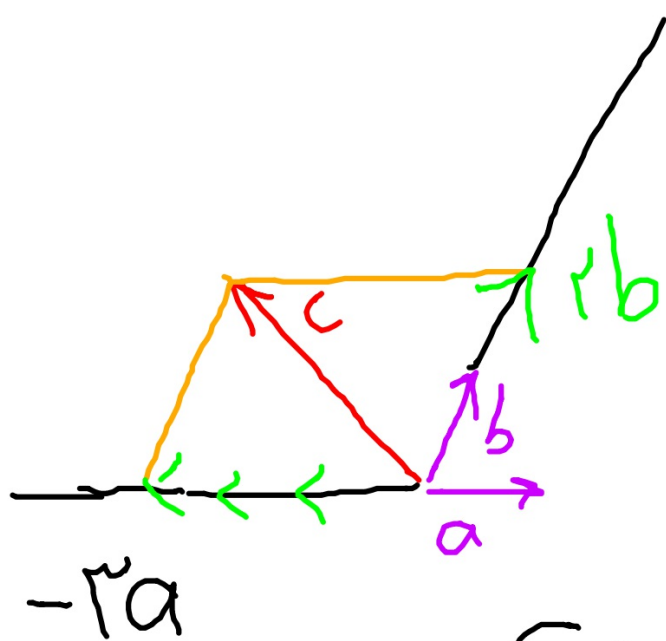
$$\underline{-r}x = \begin{bmatrix} r \\ -14 \end{bmatrix}$$

$$x = \begin{bmatrix} r \\ -14 \end{bmatrix} \div (-1) = \begin{bmatrix} -r \\ 14 \end{bmatrix}$$

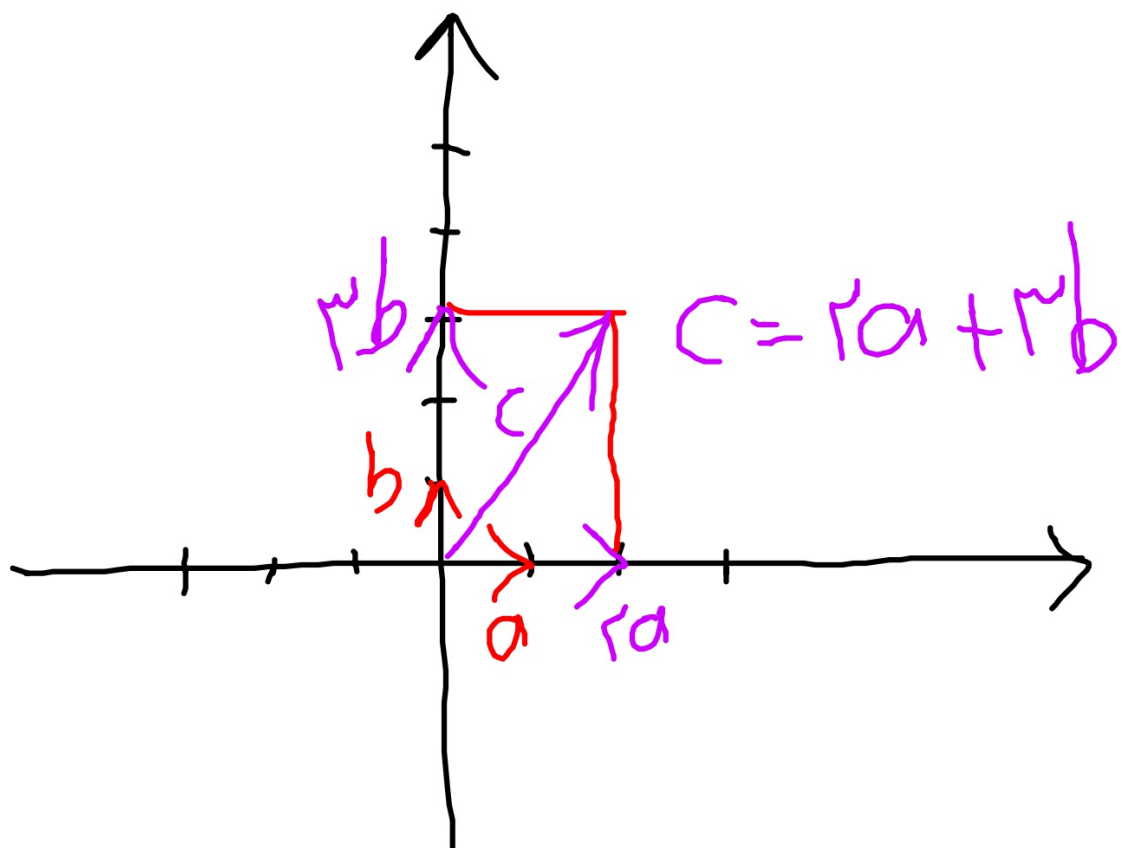
$$rx + r \begin{bmatrix} -r \\ 1 \end{bmatrix} = -r \begin{bmatrix} r \\ -r \end{bmatrix} \quad rx \begin{bmatrix} -r \\ 1 \end{bmatrix} \div r \begin{bmatrix} -r \\ 1 \end{bmatrix}$$

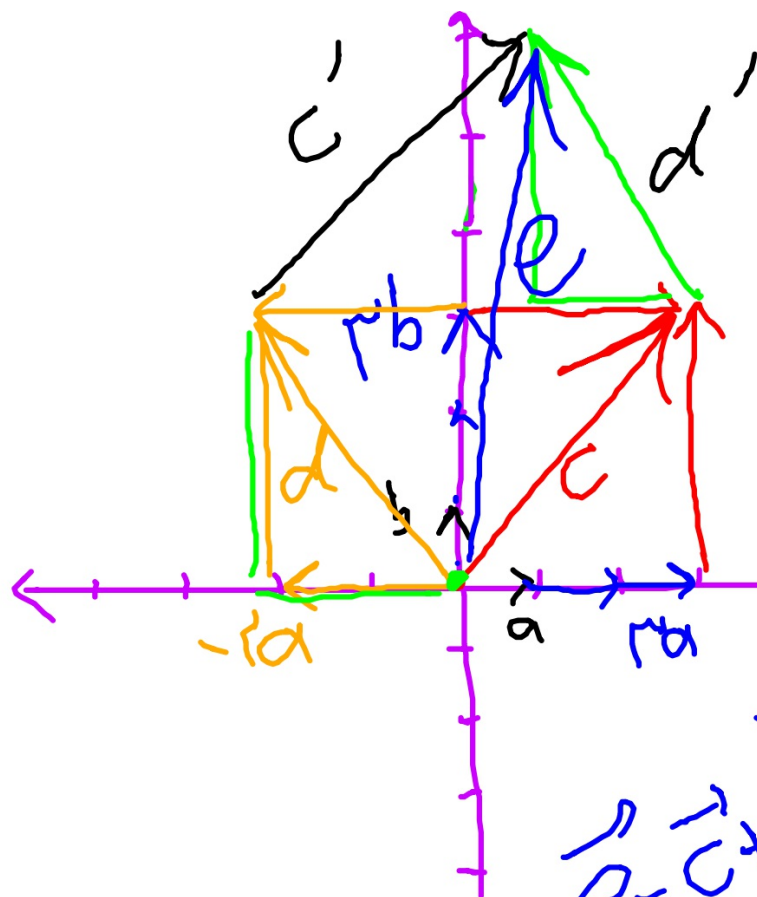
$$rx + \begin{bmatrix} -4 \\ r \end{bmatrix} = \begin{bmatrix} -4 \\ r \end{bmatrix} \Rightarrow \underline{rx} = \begin{bmatrix} -4 \\ r \end{bmatrix} + \begin{bmatrix} 4 \\ -r \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$





$$c = -ra + rb$$





$$\vec{e} = \vec{c} + \vec{d}$$

$$\vec{d} = -\vec{c} + \vec{b}$$

سپیس کا جمع
دو بردار

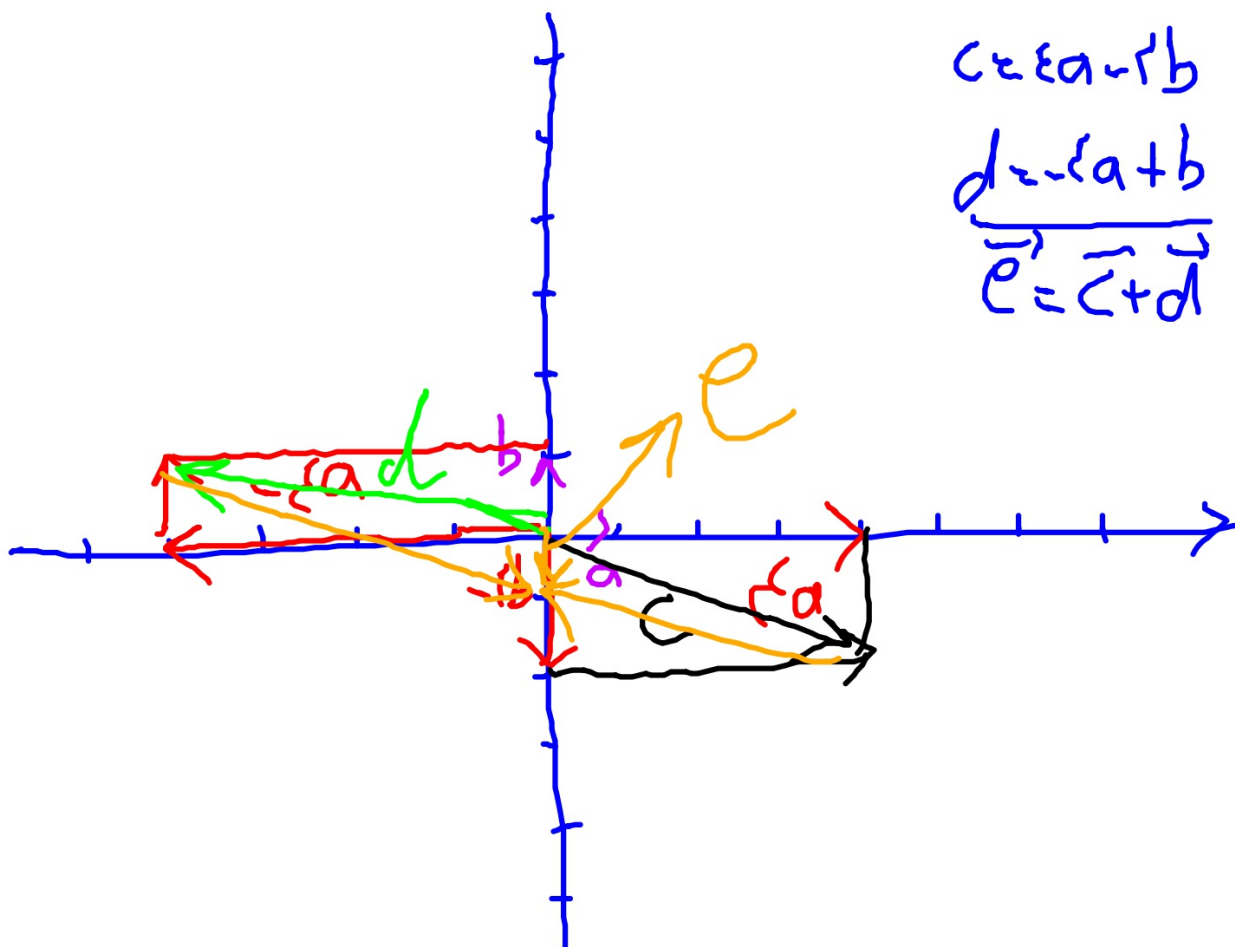
$$\vec{e} = \vec{c} + \vec{d}$$

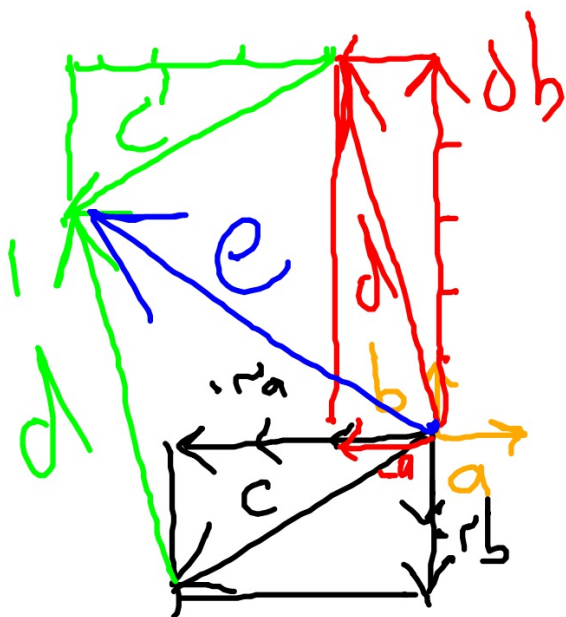
رہا اس کے لیے

$$c = \epsilon a - \gamma b$$

$$d = -\epsilon a + b$$

$$\vec{e} = \vec{c} + \vec{d}$$





$$c = \begin{bmatrix} -a \\ b \end{bmatrix}$$

$$\vec{e} = \vec{c} + \vec{d}$$

$$c = -a + b$$

$$d = -a + b$$

$$(-1) \begin{pmatrix} 2 \\ 0 \end{pmatrix} - \begin{pmatrix} 2 \\ 0 \end{pmatrix} = \begin{pmatrix} -2 \\ -0 \end{pmatrix} + \begin{pmatrix} -2 \\ -0 \end{pmatrix} = \begin{pmatrix} -4 \\ -1 \end{pmatrix}$$

$$(-4) \begin{pmatrix} 0 \\ v \end{pmatrix} - \begin{pmatrix} 2 \\ -1 \end{pmatrix} = \begin{pmatrix} 20 \\ -20 \end{pmatrix} + \begin{pmatrix} -2 \\ 1 \end{pmatrix} = \begin{pmatrix} 18 \\ -19 \end{pmatrix}$$

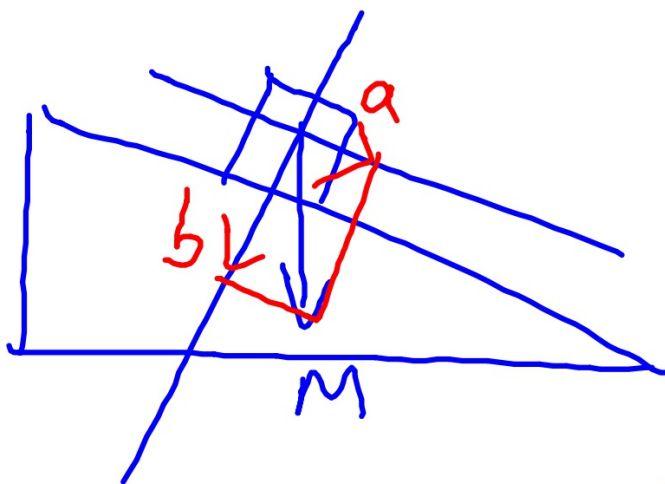
$$\left(-\frac{1}{2}\right) \begin{pmatrix} 12 \\ 18 \end{pmatrix} + 2 \begin{pmatrix} v \\ 2 \end{pmatrix} = \begin{pmatrix} -6 \\ 9 \end{pmatrix} + \begin{pmatrix} 22 \\ 18 \end{pmatrix} = \begin{pmatrix} 16 \\ 27 \end{pmatrix}$$

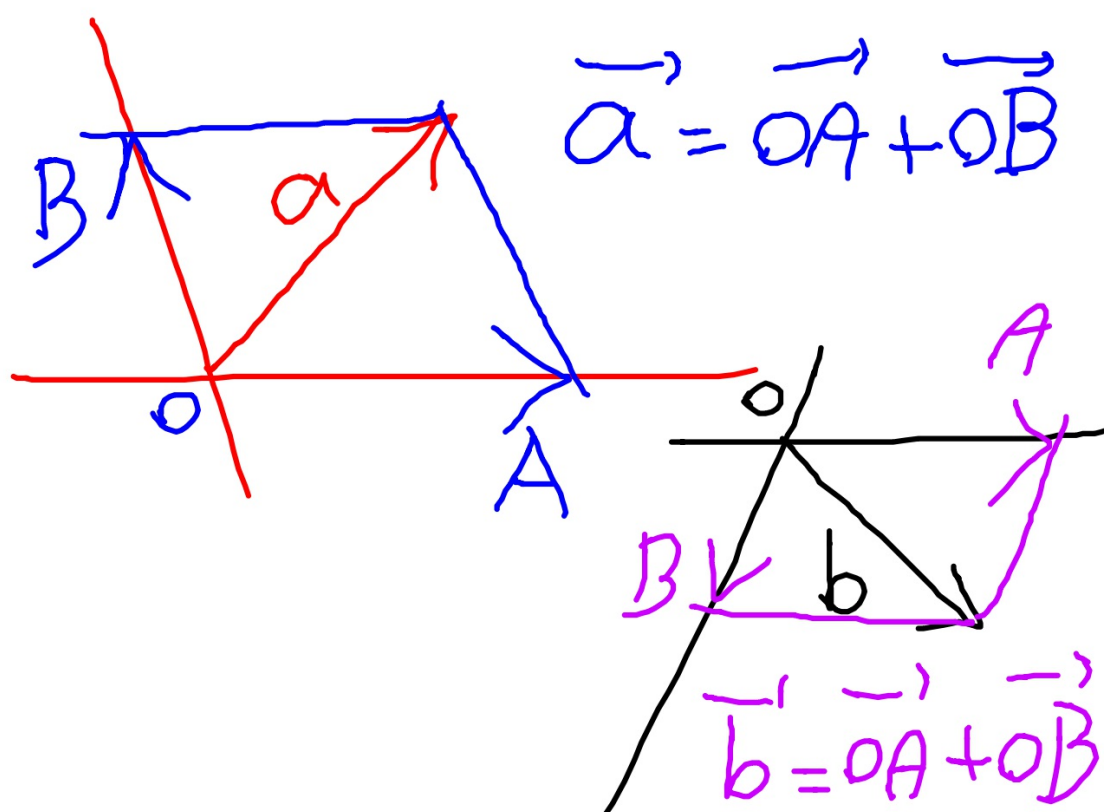
$$x = \begin{bmatrix} 1 \\ -1 \end{bmatrix} \Rightarrow x = \begin{bmatrix} 1 \\ -1 \end{bmatrix} \div 1 = \begin{bmatrix} 1 \\ -1 \end{bmatrix}$$

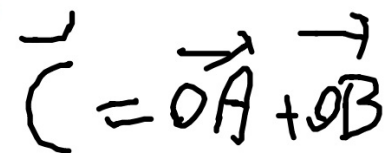
$$-3x = \begin{bmatrix} 1 \\ -9 \end{bmatrix} \Rightarrow x = \begin{bmatrix} 1 \\ -9 \end{bmatrix} \div (-3) = \begin{bmatrix} -1/3 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 1 \\ 0 \end{bmatrix} + x = \begin{bmatrix} 0 \\ 0 \end{bmatrix} \Rightarrow x = \begin{bmatrix} 0 \\ 0 \end{bmatrix} + \begin{bmatrix} -1 \\ -0 \end{bmatrix} = \begin{bmatrix} -1 \\ -0 \end{bmatrix}$$

$$\begin{bmatrix} 1 \\ 0 \end{bmatrix} + x = \begin{bmatrix} -1 \\ 9 \end{bmatrix} \Rightarrow x = \begin{bmatrix} -1 \\ 9 \end{bmatrix} + \begin{bmatrix} -1 \\ -0 \end{bmatrix} = \begin{bmatrix} -2 \\ 9 \end{bmatrix}$$



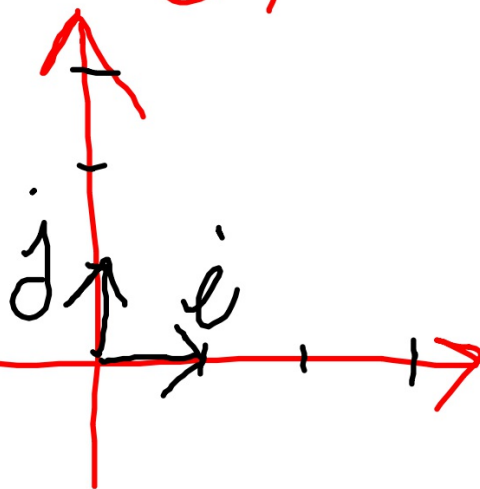




بردارک واحد مختصات $\left\{ \begin{array}{l} \hat{i}: \text{یک واحد در محور عمودی} \\ \hat{j}: \text{یک واحد در محور عرضی} \end{array} \right\}$

$$\hat{i} = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

$$\hat{j} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$



$$\vec{a} = -3\vec{i} + 2\vec{j}$$

مختصات بردار a
را به صورت آدرس

$$\vec{a} = -3 \begin{bmatrix} 1 \\ 0 \end{bmatrix} + 2 \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

$$a_x \begin{bmatrix} -3 \\ 0 \end{bmatrix} + \begin{bmatrix} 0 \\ 2 \end{bmatrix} = \begin{bmatrix} -3 \\ 2 \end{bmatrix}$$

اگر $\vec{a} = -2i + 5j$ و $\vec{b} = i - 3j$ ، $\vec{c} = 2\vec{a} + 3\vec{b}$ را به صورت آدریزه
مختصه برابر $\vec{c}$ را به دست آورید.

$$\begin{aligned}\vec{a} = -2i + 5j &= \begin{bmatrix} -2 \\ 5 \end{bmatrix} & \vec{c} = 2\vec{a} + 3\vec{b} = \\ \vec{b} = i - 3j &= \begin{bmatrix} 1 \\ -3 \end{bmatrix} & \vec{c} = 2\begin{bmatrix} -2 \\ 5 \end{bmatrix} + 3\begin{bmatrix} 1 \\ -3 \end{bmatrix} = \\ & & 2\begin{bmatrix} -4 \\ 10 \end{bmatrix} + \begin{bmatrix} 3 \\ -9 \end{bmatrix} = \begin{bmatrix} -1 \\ 1 \end{bmatrix}\end{aligned}$$

$$d = -\delta i + r j = \begin{pmatrix} -\delta \\ r \end{pmatrix}$$

$$f = r j - \kappa i = \begin{pmatrix} -\kappa \\ r \end{pmatrix}$$

$$e = \delta j = \begin{pmatrix} \delta \\ 0 \end{pmatrix} \quad \vec{m} = i - g j = \begin{pmatrix} 1 \\ -g \end{pmatrix}$$

$$a = \begin{bmatrix} t \\ -r \end{bmatrix} = \kappa \dot{x} - \mu \dot{y}$$

