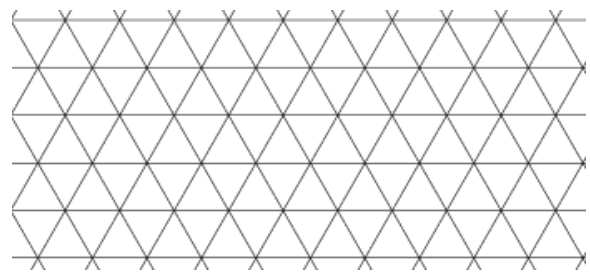
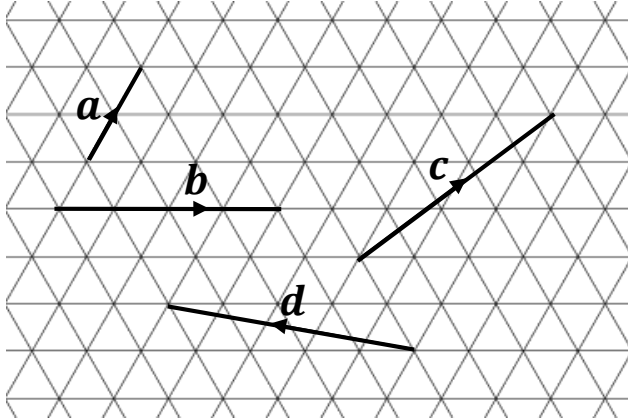
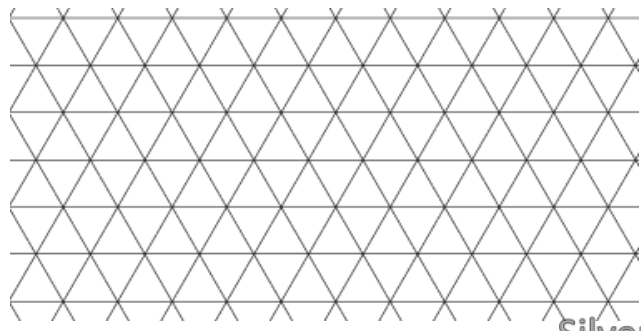




Timester Challenge

Column Vectors



<p>$\mathbf{a} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$. Calculate the resultant vector $\mathbf{a} + \mathbf{b}$.</p> <p style="text-align: right;">Bronze ★</p>	<p>If $\mathbf{a} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$ and $\mathbf{b} = -2\mathbf{a}$ Draw vector \mathbf{b} on the isometric paper.</p>  <p style="text-align: right;">Silver ★</p>	 <p>Vectors \mathbf{a}, \mathbf{b}, \mathbf{c} and \mathbf{d} are shown on the grid. Write the column vectors of the following</p>
<p>$\mathbf{a} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$. Calculate the resultant vector $\mathbf{a} - \mathbf{b}$.</p> <p style="text-align: right;">Bronze ★</p>		
<p>$\mathbf{a} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$ Calculate the scalar vector $3\mathbf{a}$.</p> <p style="text-align: right;">Bronze ★</p>	<p>$\mathbf{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$. Draw the resultant vector \mathbf{c} when $\mathbf{c} = \mathbf{a} + \mathbf{b}$.</p>  <p style="text-align: right;">Silver ★</p>	



Timester Challenge

Column Vectors



Answers

$$\mathbf{a} = \begin{pmatrix} -2 \\ 5 \end{pmatrix} \text{ and } \mathbf{b} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}.$$

Calculate the resultant vector $\mathbf{a} + \mathbf{b}$.

$$\begin{pmatrix} -2 \\ 5 \end{pmatrix} + \begin{pmatrix} 3 \\ -1 \end{pmatrix} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$$

Bronze ★

$$\mathbf{a} = \begin{pmatrix} 4 \\ -3 \end{pmatrix} \text{ and } \mathbf{b} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}.$$

Calculate the resultant vector $\mathbf{a} - \mathbf{b}$.

$$\begin{pmatrix} 4 \\ -3 \end{pmatrix} - \begin{pmatrix} -2 \\ 5 \end{pmatrix} = \begin{pmatrix} -6 \\ -8 \end{pmatrix}$$

Bronze ★

$$\mathbf{a} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$$

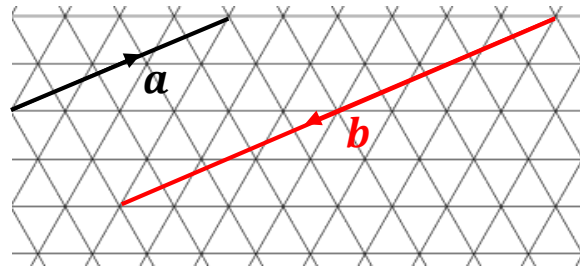
Calculate the scalar vector $3\mathbf{a}$.

$$3 \begin{pmatrix} 4 \\ -3 \end{pmatrix} = \begin{pmatrix} 4 \times 3 \\ -3 \times 3 \end{pmatrix} = \begin{pmatrix} 12 \\ -9 \end{pmatrix}$$

Bronze ★

$$\text{If } \mathbf{a} = \begin{pmatrix} 3 \\ 2 \end{pmatrix} \text{ and } \mathbf{b} = -2\mathbf{a}$$

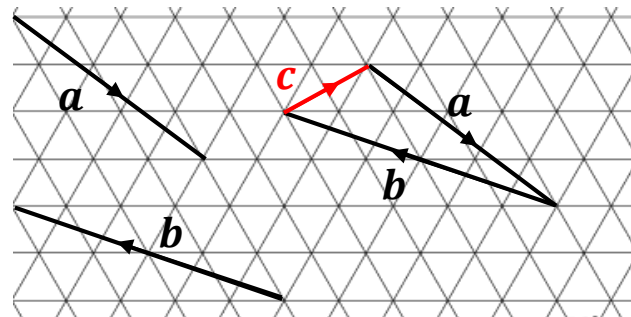
Draw vector \mathbf{b} on the isometric paper.



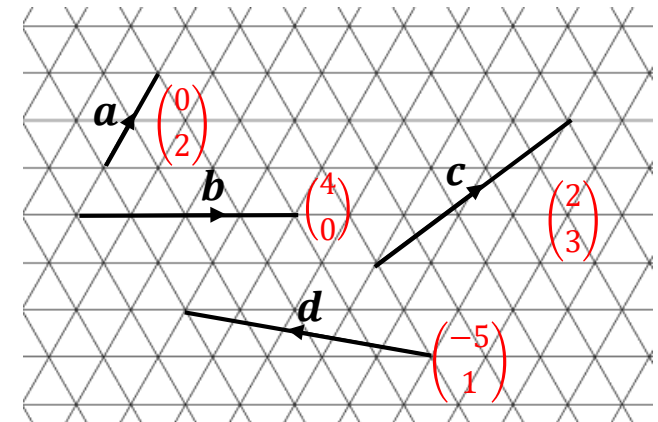
Silver ★

$$\mathbf{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix} \text{ and } \mathbf{b} = \begin{pmatrix} -4 \\ 2 \end{pmatrix}.$$

Draw the resultant vector \mathbf{c} when $\mathbf{c} = \mathbf{a} + \mathbf{b}$.



Silver ★



Vectors \mathbf{a} , \mathbf{b} , \mathbf{c} and \mathbf{d} are shown on the grid. Write the column vectors of the following

- 1) $\mathbf{a} \begin{pmatrix} 0 \\ 2 \end{pmatrix}$
- 2) $\mathbf{d} \begin{pmatrix} -5 \\ 1 \end{pmatrix}$
- 3) $\mathbf{a} + \mathbf{c} \begin{pmatrix} 0 \\ 2 \end{pmatrix} + \begin{pmatrix} 2 \\ 3 \end{pmatrix} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$
- 4) $4\mathbf{c} \ 4 \begin{pmatrix} 2 \\ 3 \end{pmatrix} = \begin{pmatrix} 8 \\ 12 \end{pmatrix}$
- 5) $\frac{1}{2}\mathbf{b} \ \frac{1}{2} \begin{pmatrix} 4 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \\ 0 \end{pmatrix}$

Gold ★