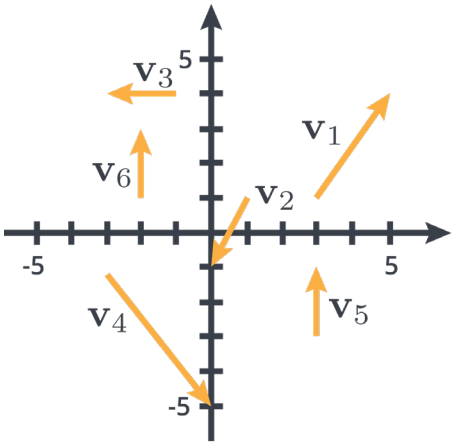
## EXERCISES

# Module One

1.) Write down the components of the following vectors.

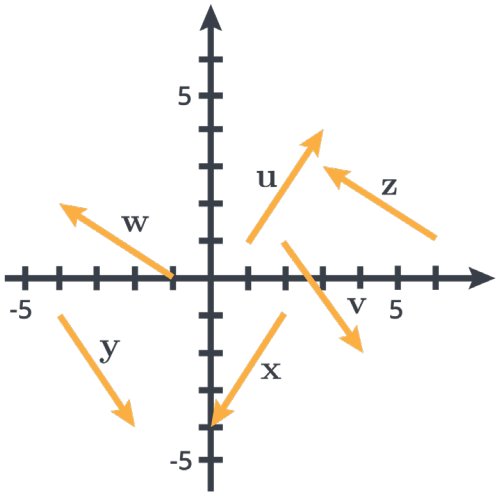



$\mathbf{v}_1 =$ $\mathbf{v}_4 =$

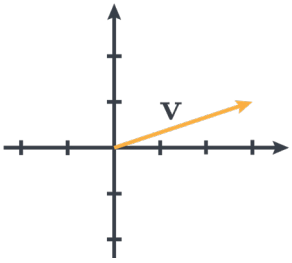
$\mathbf{v}_2 =$ $\mathbf{v}_5 =$

$\mathbf{v}_3 =$ $\mathbf{v}_6 =$

2.) Which of the following vectors have components equal to $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$?




3.) What are the components of the vector $\mathbf{V}$?




Circle the correct answer.

a.) $\begin{pmatrix} -1 \\ 3 \end{pmatrix}$ b.) $\begin{pmatrix} 1 \\ -3 \end{pmatrix}$

c.) $\begin{pmatrix} 3 \\ 1 \end{pmatrix}$ d.) $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$

4.) Consider the vectors:

$$\mathbf{u} = \begin{pmatrix} 1 \\ 2 \end{pmatrix} \mathbf{v} = \begin{pmatrix} -3 \\ -4 \end{pmatrix} \mathbf{0} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

Compute the following:

**a.)** $\mathbf{u} + \mathbf{v}$

**b.)** $\mathbf{u} - \mathbf{v}$

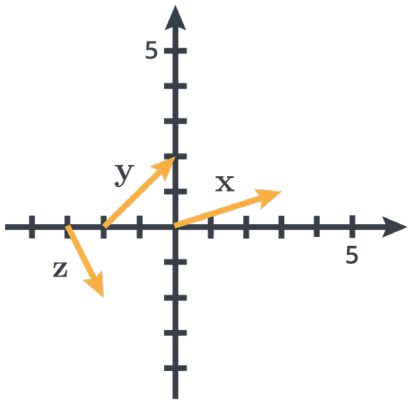
**c.)** $3\mathbf{u} + 2\mathbf{v}$

**d.)** $-2(\mathbf{u} - \mathbf{v})$

**e.)** $\mathbf{0} + \mathbf{v}$

**f.)** $50 - \mathbf{u}$

5.) Consider the vectors:




Compute the components of the following vectors:

**a.)** $2\mathbf{x}$

**b.)** $-\mathbf{x}$

**c.)** $\mathbf{x} + \mathbf{y}$

**d.)** $3\mathbf{x} + \mathbf{z}$

**e.)** $2\mathbf{y} - \mathbf{z}$

6.) What are the lengths of the following?

**a.)** $\mathbf{u} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

**b.)** $\mathbf{v} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$

**c.)** $\mathbf{w} = \begin{pmatrix} 5 \\ 7 \end{pmatrix}$

**d.)** $\mathbf{x} = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$

7.) Compute the following for $\mathbf{v} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$:

**a.)** $||\mathbf{v}||$

**b.)** $||2\mathbf{v}||$

**c.)** $||-\mathbf{v}||$