

✓ **Congratulations! You passed!**

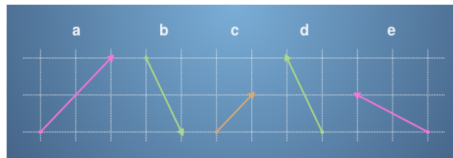
Grade received 100% To pass 80% or higher

Go to next item

1. This aim of this quiz is to familiarise yourself with vectors and some basic vector operations.

1 / 1 point

For the following questions, the vectors **a**, **b**, **c**, **d** and **e** refer to those in this diagram:



The sides of each square on the grid are of length 1. What is the numerical representation of the vector **a**?

- ☒  $\begin{bmatrix} 2 \\ 2 \end{bmatrix}$
- ☐  $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$

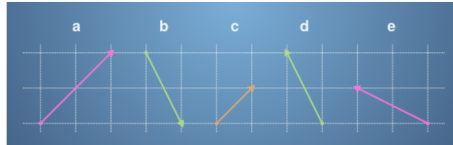
- ☐  $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$
- ☐  $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$

✓ **Correct**

You can get the numerical representation by following the arrow along the grid.

2.

1 / 1 point



Which vector in the diagram corresponds to  $\begin{bmatrix} -1 \\ 2 \end{bmatrix}$ ?

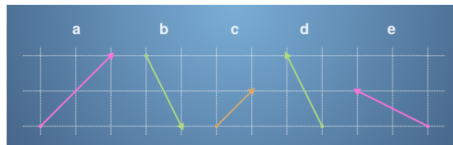
- ☐ Vector **a**
- ☐ Vector **b**
- ☐ Vector **c**
- ☒ Vector **d**

✓ **Correct**

You can get the numerical representation by following the arrow along the grid.

3.

1 / 1 point



What vector is  $2\mathbf{e}$ ?

Please select all correct answers.

- ☒  $\begin{bmatrix} 2 \\ 2 \end{bmatrix}$

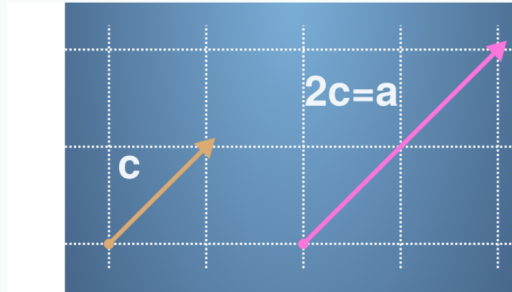
✓ **Correct**

A scalar multiple of a vector can be calculated by multiplying each component.

- ☐  $\begin{bmatrix} -2 \\ 2 \end{bmatrix}$
- ☐  $\mathbf{e}$
- ☒  $\mathbf{a}$

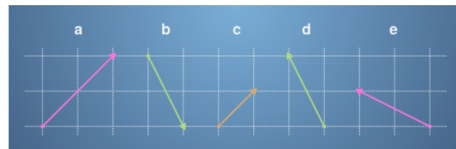
✓ Correct

Multiplying by a positive scalar is like stretching out a vector in the same direction.



4.

1 / 1 point



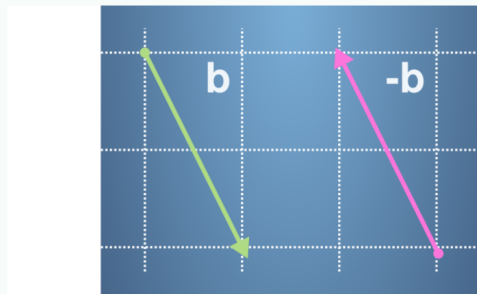
What vector is  $-\mathbf{b}$ ?

Please select all correct answers.

- ☐  $\mathbf{e}$
- ☒  $\mathbf{d}$

✓ Correct

Multiplying by a negative number points the vector in the opposite direction.



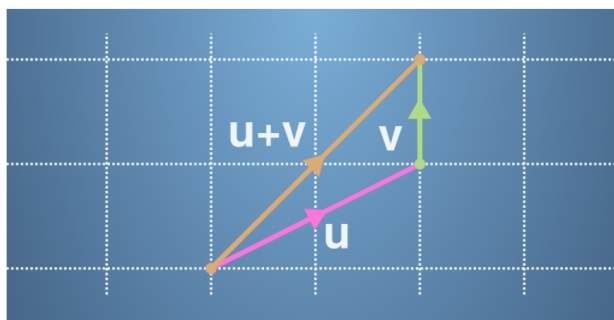
- ☐  $\begin{bmatrix} -2 \\ 1 \end{bmatrix}$
- ☒  $\begin{bmatrix} -1 \\ 2 \end{bmatrix}$

✓ Correct

A scalar multiple of a vector can be calculated by multiplying each component.

5. In the previous videos you saw that vectors can be added by placing them start-to-end. For example, the following diagram represents the sum of two new vectors,  $\mathbf{u} + \mathbf{v}$ :

1 / 1 point



The sides of each square on the grid are still of length 1. Which of the following equations does the diagram represent?

- ☐  $\begin{bmatrix} 1 \\ 1 \end{bmatrix} + \begin{bmatrix} 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$
- ☐  $\begin{bmatrix} 1 \\ 2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$

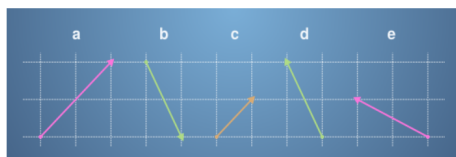
- ☒  $\begin{bmatrix} 2 \\ 1 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$
- ☐  $\begin{bmatrix} 1 \\ 2 \end{bmatrix} + \begin{bmatrix} 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$

✓ Correct

We can see that summing the vectors by adding them start-to-end and adding up the individual components gives us the same answer.

6. Let's return to our vectors defined by the diagram below:

1 / 1 point



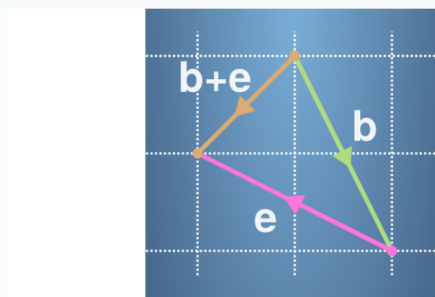
What is the vector  $\mathbf{b} + \mathbf{e}$ ?

- ☒  $\begin{bmatrix} -1 \\ -1 \end{bmatrix}$

- ☐  $\begin{bmatrix} 1 \\ 3 \end{bmatrix}$
- ☐  $\begin{bmatrix} -1 \\ 2 \end{bmatrix}$
- ☐  $\begin{bmatrix} 2 \\ -1 \end{bmatrix}$

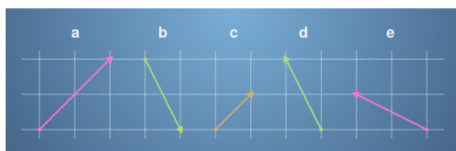
✓ Correct

Vectors are added together entry by entry. They can also be thought of as adding start to end, like in the following diagram:



7.

1 / 1 point

What is the vector  $\mathbf{d} - \mathbf{b}$ ?

- ☒  $\begin{bmatrix} -2 \\ 4 \end{bmatrix}$
- ☐  $\begin{bmatrix} -4 \\ 2 \end{bmatrix}$
- ☐  $\begin{bmatrix} 2 \\ -4 \end{bmatrix}$
- ☐  $\begin{bmatrix} 4 \\ -2 \end{bmatrix}$

✔ Correct

Remember that vectors add by attaching the end of one to the start of the other, and that multiplying by a negative number points the vector in the opposite direction.

