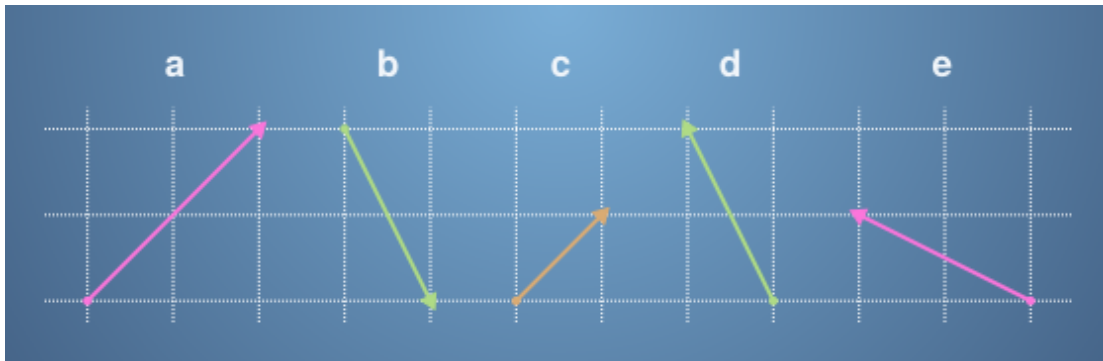


1. This aim of this quiz is to familiarise yourself with vectors and some basic vector operations.

1 / 1 punto

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**?



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



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



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



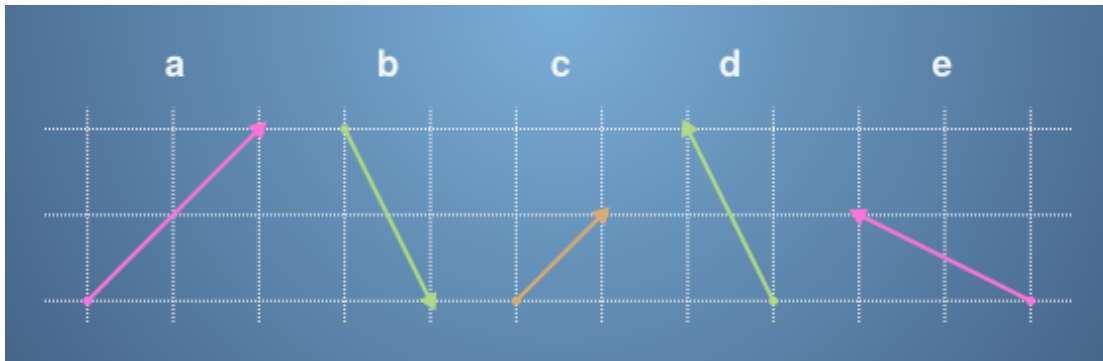
$$\begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

✓ Correcto

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

2.

1 / 1 punto



Which vector in the diagram corresponds to

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

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

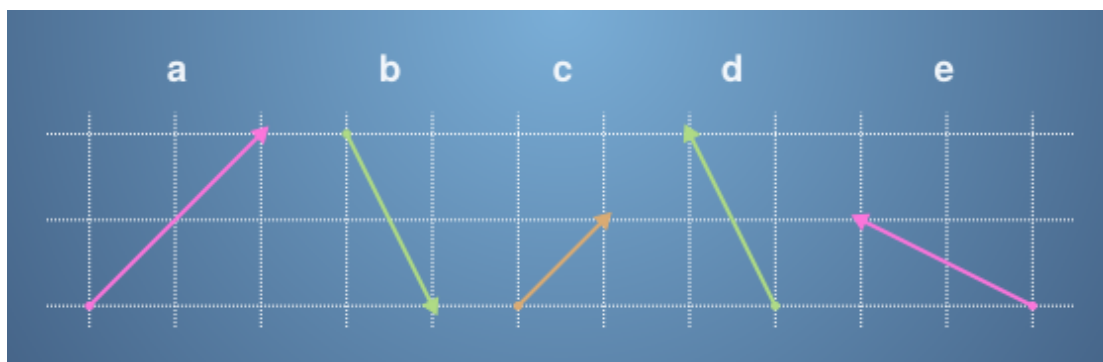
- ☐ Vector **a**
- ☐ Vector **b**
- ☐ Vector **c**
- ☒ Vector **d**

✓ **Correcto**

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

3.

1 / 1 punto



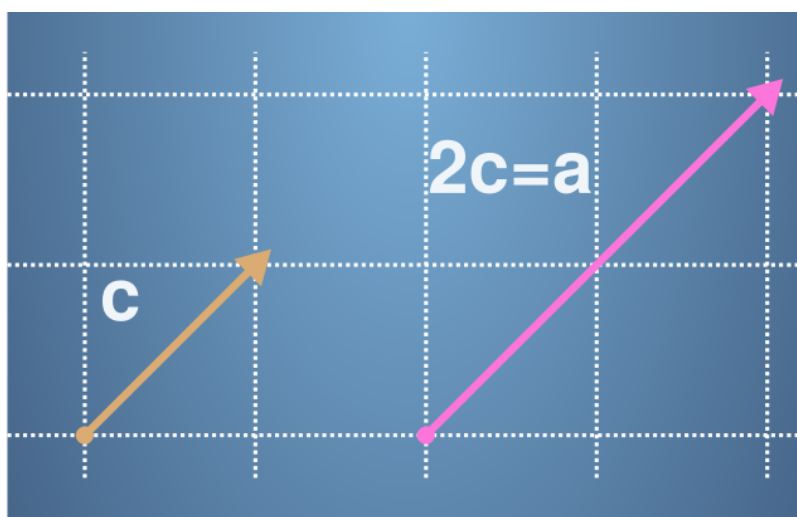
What vector is $2\mathbf{c}$?

Please select all correct answers.

☒ **a**

☒ **Correcto**

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



☒

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

☒ **Correcto**

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

☐ **e**

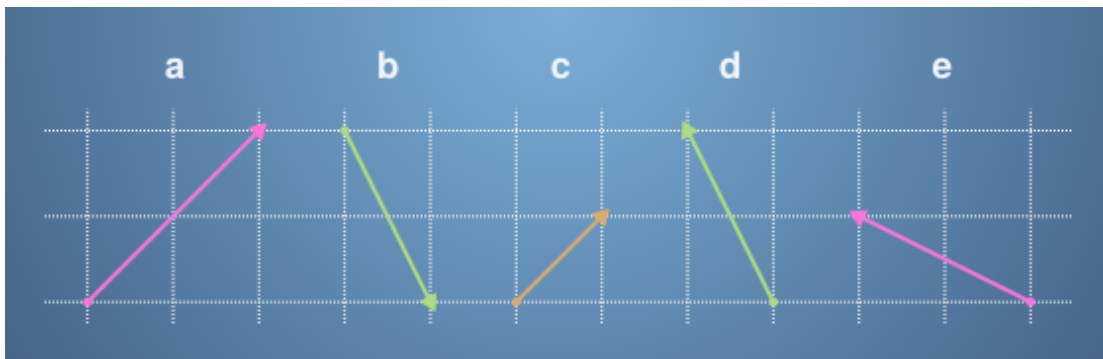


$$\begin{bmatrix} -2 \\ 2 \end{bmatrix}$$

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

4.

1 / 1 punto



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

Please select all correct answers.



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

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



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

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

✓ Correcto

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



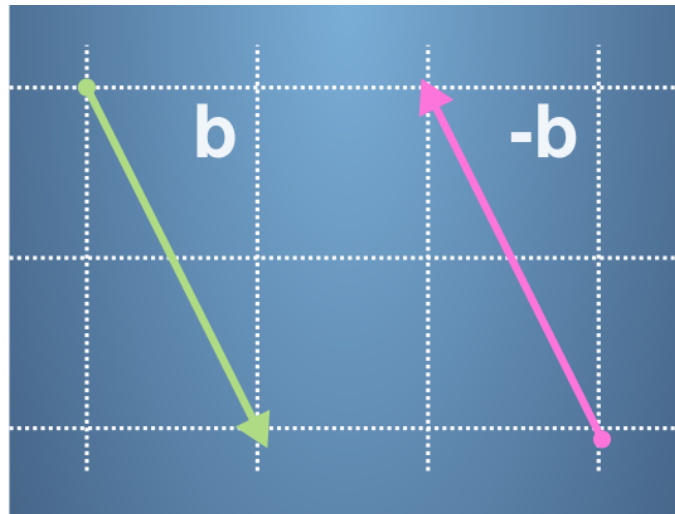
e



d

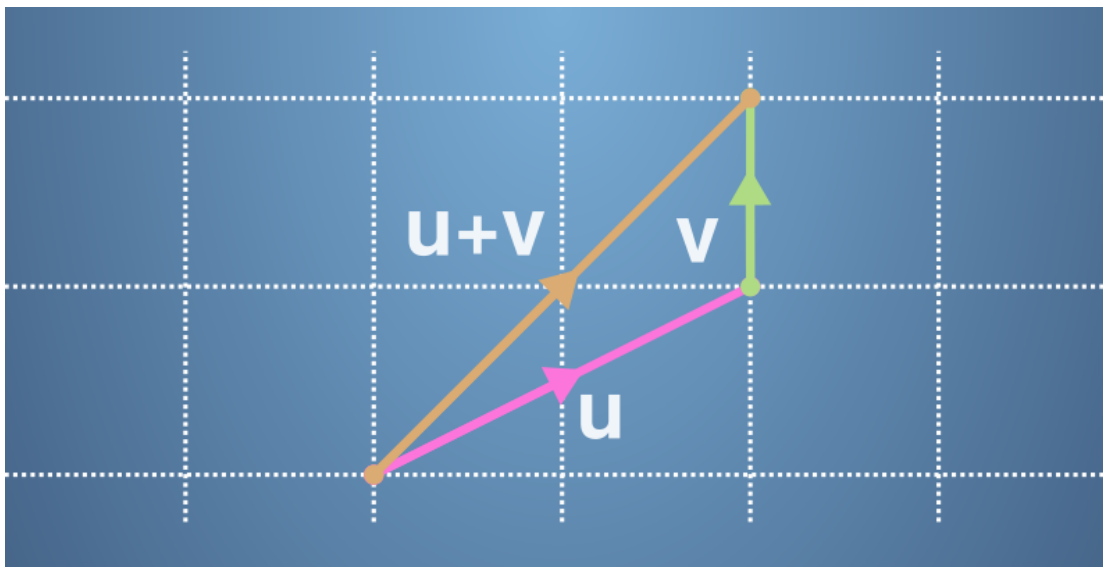
✓ Correcto

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



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 punto



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

○

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

○

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

○

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



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

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

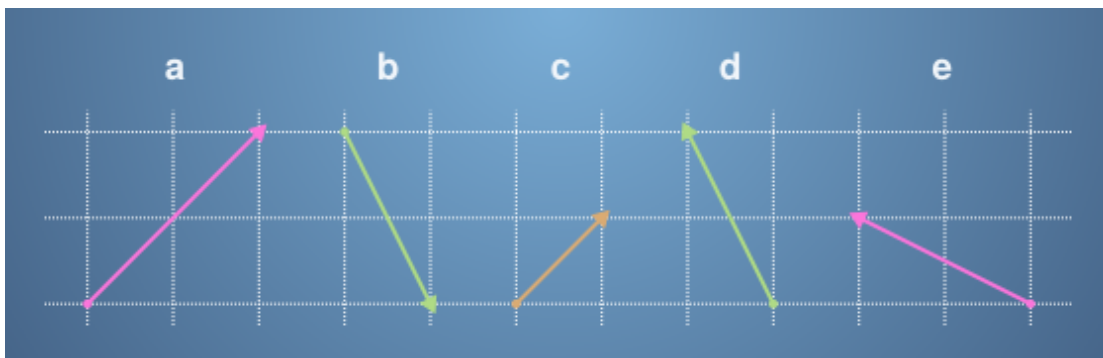


Correcto

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 punto



What is the vector **b** + **e**?



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

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



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

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

☐

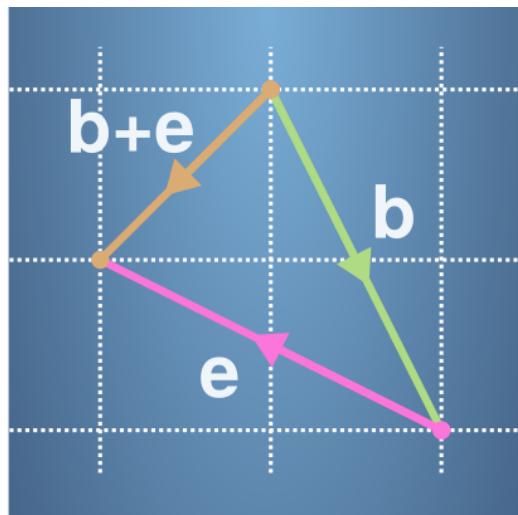
$$\begin{bmatrix} -1 \\ 2 \end{bmatrix}$$
$$\begin{bmatrix} -1 \\ 2 \end{bmatrix}$$

☐

$$\begin{bmatrix} 1 \\ 3 \end{bmatrix}$$
$$\begin{bmatrix} 1 \\ 3 \end{bmatrix}$$

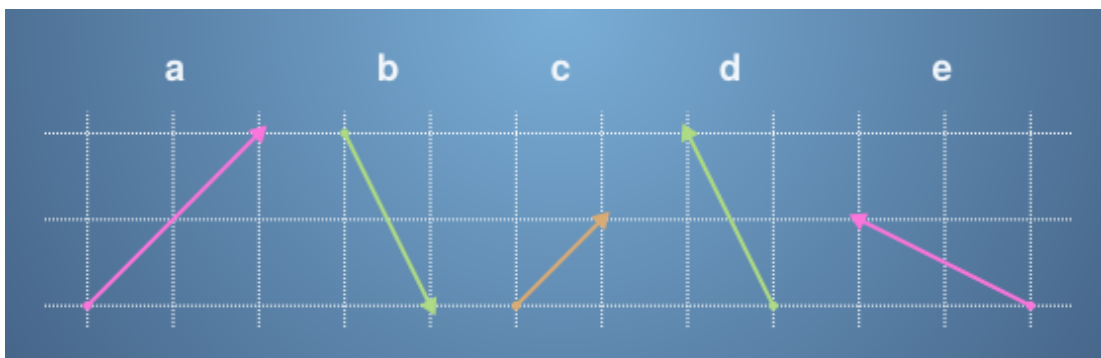
☒ **Correcto**

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 punto



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



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

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



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

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



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

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



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

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



Correcto

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.

