

## Answer on Question #58495 – Math – Vector Calculus

### Question

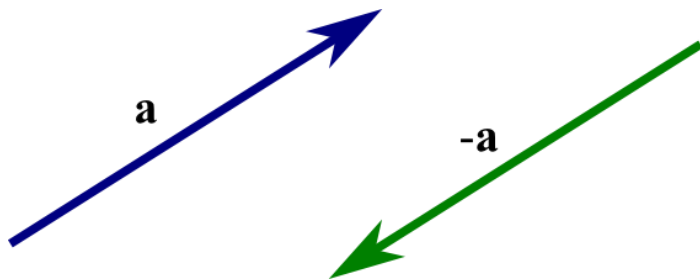
Why there is no any particular rule to subtract vectors

### Solution

It is because subtraction is defined as addition with the opposite of a vector:

$$\vec{b} - \vec{a} = \vec{b} + (-\vec{a}) = \vec{x}$$

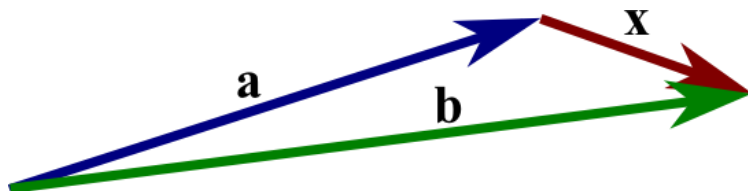
For this we need to define the rule to add two vectors and define the vector  $-\vec{a}$ , which is the opposite of  $\vec{a}$ . The vector  $-\vec{a}$  is the vector with the same magnitude as  $\vec{a}$  but that is pointed in the opposite direction.



The sum of two vectors can be found using either the parallelogram method or the triangle method.

By the parallelogram method, complete the parallelogram on  $\vec{b}$ ,  $-\vec{a}$  and draw the diagonals of the parallelogram from the initial point.

Equality  $\vec{x} = \vec{b} - \vec{a}$  is equivalent to  $\vec{b} = \vec{x} + \vec{a}$ . By triangle method complete the triangle.



Similarly

$$\vec{a} - \vec{b} = \vec{a} + (-\vec{b})$$

