
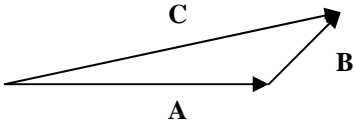

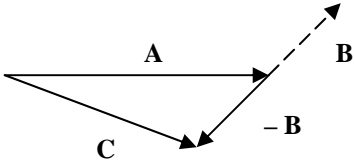



Properties of Vectors

Listed below are some properties of vectors and vector quantities. Learn them.
 (excerpted from **Physics for Scientists and Engineers** by Paul Tipler, 5th Ed.)

<u>Property</u>	<u>Explanation</u>	<u>Figure</u>	<u>Component representation</u>
<u>Equality</u>	$\mathbf{A} = \mathbf{B}$ if $ \mathbf{A} = \mathbf{B} $ and their directions are the same. (We say these vectors are <u>parallel</u> .)		$A_x = B_x$ $A_y = B_y$ $A_z = B_z$
<u>Addition</u>	$\mathbf{C} = \mathbf{A} + \mathbf{B}$		$C_x = A_x + B_x$ $C_y = A_y + B_y$ $C_z = A_z + B_z$
<u>Negative of a vector</u>	$\mathbf{A} = -\mathbf{B}$ if $ \mathbf{A} = \mathbf{B} $ and their directions are the opposite. (We say these vectors are <u>anti-parallel</u> .)		$A_x = -B_x$ $A_y = -B_y$ $A_z = -B_z$
<u>Subtraction</u>	$\mathbf{C} = \mathbf{A} - \mathbf{B}$		$C_x = A_x - B_x$ $C_y = A_y - B_y$ $C_z = A_z - B_z$
<u>Scalar Multiplication of a vector</u>	$\mathbf{B} = s\mathbf{A}$ has magnitude $ \mathbf{B} = s \mathbf{A} $ and has the same direction as \mathbf{A} if s is positive and $-\mathbf{A}$ if s is negative. (s is a scalar quantity.)		$B_x = sA_x$ $B_y = sA_y$ $B_z = sA_z$