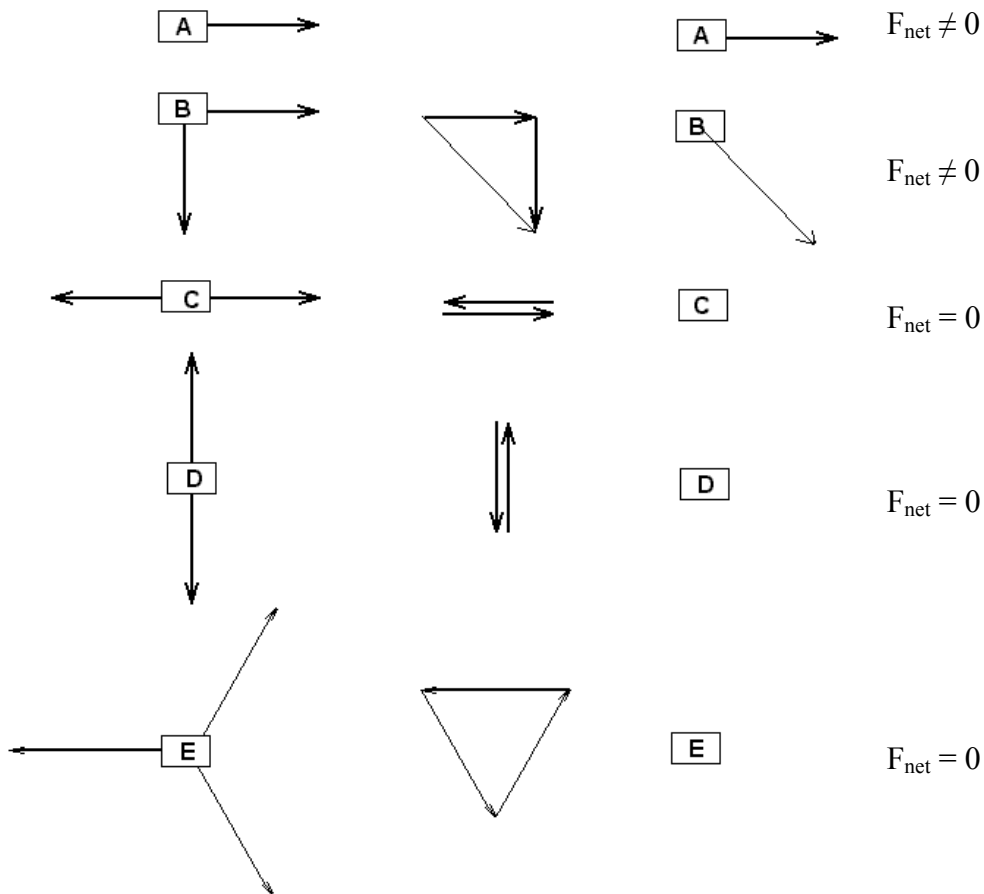


Lesson #5: Forces in Equilibrium

What do forces do? They try to make things move. More than one force may act on an object at one time, however. Due to their inherent directional nature, forces may work with each other or oppose each other. Forces will be represented as vectors to include their direction character in our calculations. We'll use head-to-tail addition to illustrate the working of a single force and multiple forces acting on a single object.

Here are some typical force diagrams on the left. The vector additions are in the middle. The net force diagram appears on the right. The first two objects have a net force on them and will be accelerated by the net force in the direction of the net force. The last three have no net force acting on them and so, we say, they are "in equilibrium," because the vector addition shows the forces adding up to zero. That is, the head to tail summation brings the vector addition back to its starting point.



The middle column with the arrows added head-to-tail is one way to write a vector equation. We can also write vector equations using polar forms and component forms. To use those form you would need to name each vector before you begin.