Let's say that you have two parallel wires through which electric current passes. And let's say that the electric currents pass along the same direction. See the figure. The second electric current (i.e. 12) generates magnetic field around it. And, from our last article we know that electric current receives the force in the presence of magnetic field. As there is a magnetic field (i.e. B2) at the place in which the first wire (i.e. 11) lies it receives the force (F12), toward the second wire. You can check the direction of force using the right-hand rule introduces in last article. If you also consider the magnetic field due to the first wire at the place where the second wire is you will be able to convince yourself that the second wire receives force toward the first wire. In other words, they attract each other. Similarly, if the electric current of two wires are in opposite direction, they repel each other.



Figure 1

Problem 1. See Fig.2. Suppose at the point A, B, and C which form an equilateral triangle ABC, three equal electric currents flow. What is the direction of the magnetic force on the wire A? (Hint: Use vector addition)

Problem 2. See. Fig.3 Suppose D, E, and F form an equilateral triangle DEF. At E current I flow out of the page while at each D and F current I flows into the page. What is the direction of the magnetic force on the wire D? (Hint: Use vector addition)



Figure 2

Summary

Two parallel electric wires attrach each other if their two electric currents are in the same direction and repel each other if they are in the opposite direction.