

# PhyzJob: Magnetic Force Directions



The **magnetic force** on a current-carrying wire (or charged particle) can be described as a cross-product (vector product). The **direction** of a vector product is perpendicular to both vectors being multiplied, and follows a “right-hand rule.” If a magnetic force is acting on a current-carrying wire, then you can, while holding your hand flat, point your thumb in the direction of current, point your fingers in the direction of the magnetic field, and point your palm in the direction of the magnetic force. Try your hand at the following to get a feel for the directions involved in magnetic force.

If a zero quantity (such as force) arises, write “Zero”. If a scenario is impossible, write “Impossible”.

|     | Current ( <b>I</b> ) | Magnetic Field ( <b>B</b> ) | Magnetic Force ( <b>F</b> ) |
|-----|----------------------|-----------------------------|-----------------------------|
| Ex. | →                    | ↑                           | •                           |
| 1   | ↑                    | →                           |                             |
| 2   | ←                    | •                           |                             |
| 3   | ×                    | ↓                           |                             |
| 4   |                      | →                           | •                           |
| 5   | →                    |                             | ×                           |
| 6   |                      | ×                           | ←                           |
| 7   | •                    |                             | →                           |
| 8   | ↑                    | ↓                           |                             |
| 9   | ×                    |                             | •                           |
| 10  |                      |                             | ↑                           |