**MC2-RT1: Charge within a Uniform Magnetic Field—Magnetic Force**

The figures below show charged particles in an external magnetic field. All external magnetic fields are uniform and have the same strength.

Rank the strength (magnitude) of the magnetic force on each charge.

- Greatest 1, 2, 3, 4, 5, 6, Least

OR, the magnitude of the force is the same (but not zero) for all six situations.

OR, there is no magnetic force for all six situations.

OR, the ranking for the forces cannot be determined.

Carefully explain your reasoning.

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**MC2-RT2: Moving Charge Path—Direction and Strength of the Magnetic Field**

Electrically charged particles of equal mass are moving through regions of space in which there may be magnetic fields. In each case, shown is the sign of the charge and a portion of the path the charge follows through the region. (These are top views looking down on horizontally moving charges.) All of the charges enter this region with the same initial velocity.

Rank the magnetic field in the region. Fields directed out of the page (considered positive) are ranked higher than fields directed into the page (considered negative).

Greatest out of page 1, 2, 3, 4, 5, 6, Greatest into page

OR, the magnetic field in all six of these cases has the same nonzero strength.

OR, the magnetic field is zero in all six of these cases.

OR, the ranking for the magnetic field cannot be determined.

Carefully explain your reasoning.