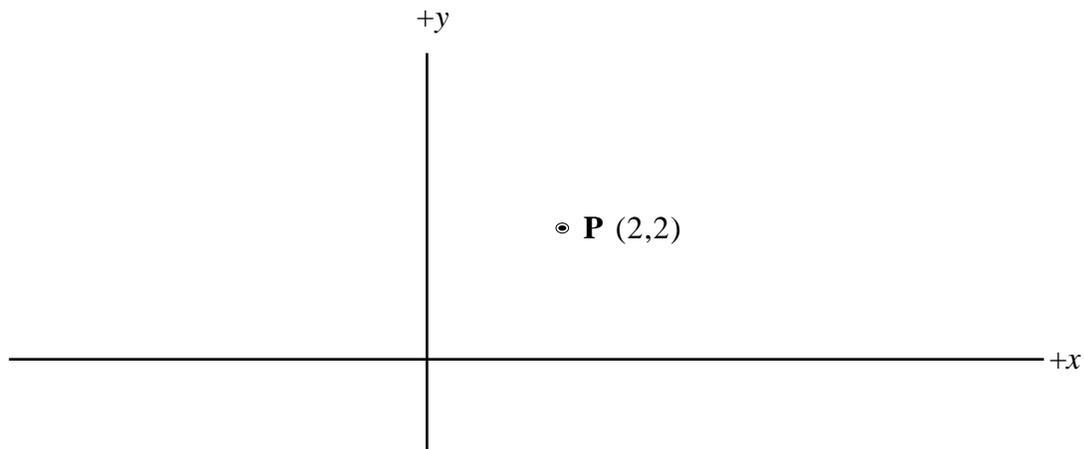


## Moving Charges in Uniform Magnetic Field—Change in Kinetic Energy<sup>183</sup>

Moving charged particles are released with a velocity (details listed below) at the point P (2 m, 2 m) in a large region of space which has a uniform magnetic field in the  $+x$  direction. All these particles have the same mass, and they are released individually into this field.

Rank from greatest to least the change in kinetic energy of these charged particles after they have traveled 1 cm from P.

Case	Charge	Speed	Direction
<b>A</b>	5 mC	3 m/s	$+x$
<b>B</b>	5 mC	3 m/s	$-x$
<b>C</b>	5 mC	3 m/s	$+y$
<b>D</b>	5 mC	3 m/s	$-y$
<b>E</b>	-10 mC	3 m/s	$+y$
<b>F</b>	+10 mC	3 m/s	$-y$
<b>G</b>	-10 mC	5 m/s	$+y$
<b>H</b>	+10 mC	5 m/s	$-y$



Greatest 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ 7 \_\_\_\_\_ 8 \_\_\_\_\_ Least

Or, the change in kinetic energy will be the same for all of these (but not zero). \_\_\_\_\_

Or, the change in kinetic energy will be zero for all of these. \_\_\_\_\_

Please carefully explain your reasoning.

How sure were you of your ranking? (circle one)

Basically Guessed

Sure

Very Sure

1      2      3      4      5      6      7      8      9      10

<sup>183</sup> C. Hieggelke