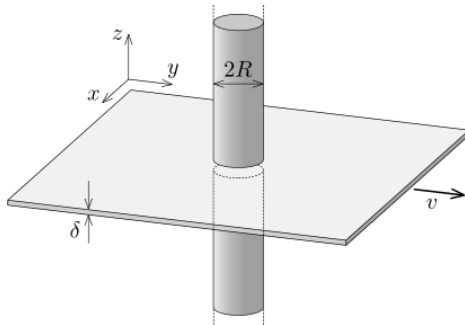


T3: Plate between magnets (10 pts)

Two identical long, cylindrical rod magnets of radius R are close to each other and share the same vertical symmetry axis. The polarity of the two magnets is the same. As a result, the magnetic field in the air gap between the magnets is directed towards the $+z$ direction (see *figure*) and uniform with flux density B . The magnetic field outside the gap is zero. A horizontal large non-magnetic metal plate is placed in the air gap and moved with constant horizontal velocity v in $+y$ -direction. The thickness of the plate is δ , the resistivity of the metal is ρ .



- (3 pts) Sketch the shape of current streamlines in the metal plate at a given time. Indicate the axes on your sketch.
- (5 pts) Find and plot the current density inside the plate along a line parallel to the y axis intersecting the symmetry axis of the magnets.
- (2 pts) Find the horizontal force required to move the plate.