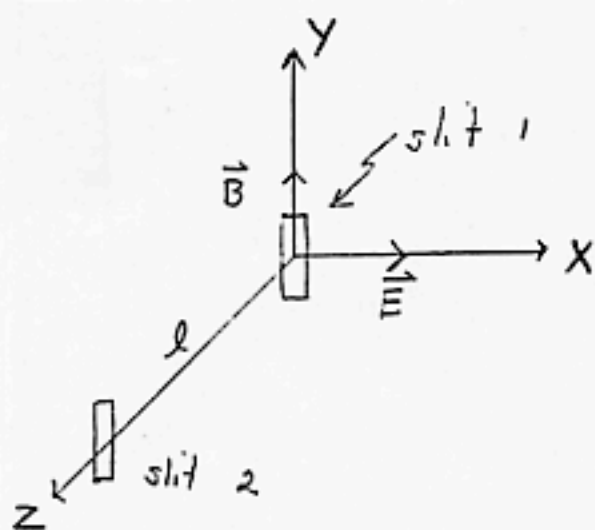


36. This is problem 3.76 of Symon.

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Particles have charge  $e$ , mass  $m$ , and a velocity  $v_0$  is supposed to be selected.

a) First see how  $\vec{E}$ ,  $\vec{B}$ , +  $v_0$  should be related. From problem 34 we know that the trajectory has the form

$$z = b + \frac{E_x}{B_y} (t - t^0) + A \cos(\omega t + \delta)$$

$$x = c - A \sin(\omega t + \delta) \quad \omega = \frac{eB}{m}$$

$$y = y^0 + v_y^0 (t - t^0)$$

For a particle to go right along the  $z$  axis we need  $A = 0$ ,  $c = 0$ ,  $y^0 = 0$ , and  $v_y^0 = 0 \Rightarrow$

$$z = b + \frac{E_x}{B_y} (t - t^0), \quad x = 0, \quad y = 0$$

Thus, set  $\boxed{\frac{E_x}{B_y} = v_0}$