proton_in_box_in_field

(a) The B field, by virtue of the right hand rule for positively charged particles, causes the proton to experience a force towards the left, thus an electric field must point towards the right (or East) to offset this force.

(b)
$$F_{magnetic} = Bvq$$
$$F_{electric} = Eq$$

When Bvq = Eq, the proton feels no net force. Simplifying, we get $v = \frac{E}{B}$

This is a pretty important relationship between magnetic fields and electric fields and you should memorize it.

(c) The magnetic force is still pulling towards the left, but as the proton turns, this force increases in a counterclockwise direction. This causes the proton to spiral in a counterclockwise direction.

(d) $a = \frac{F_{magnetic}}{m}$