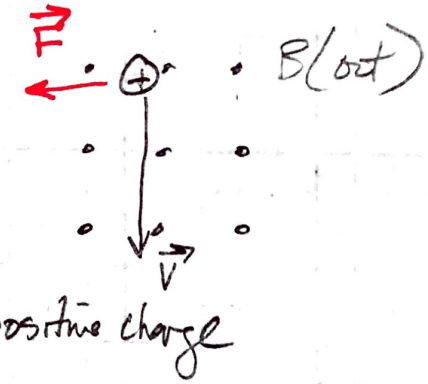
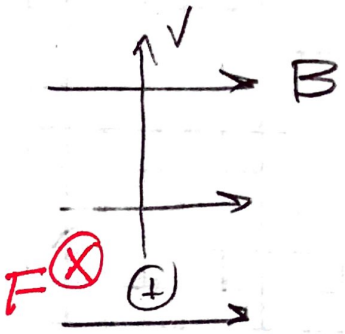
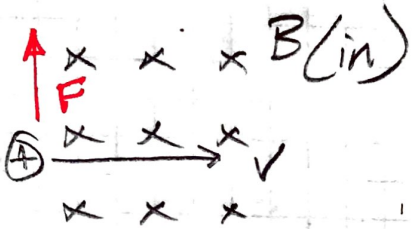
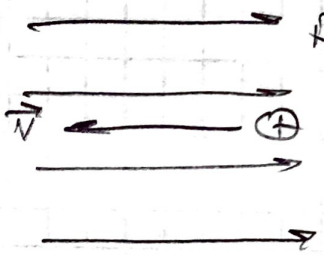
11.15

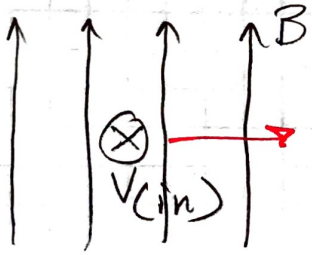
a) 

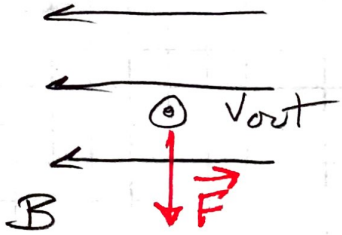
b) 

c) 

d) 

$F = qv \times B$
$= qvB \sin(180)$
$= \boxed{0}$

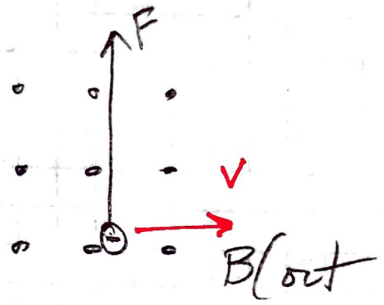
e) 

f) 

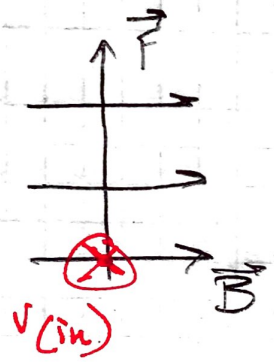
11.17 Direction of velocity for a negative charge.

Use Right-Hand Rule & flip direction, or use Left-Hand!

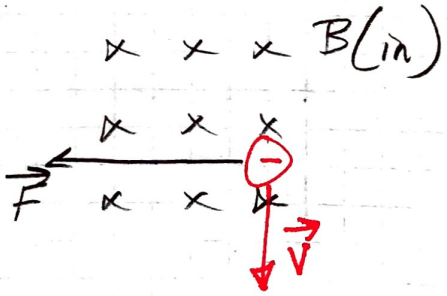
a)



b)



c)



11.25

e^- $v = 7.5e6$ m/s ($\perp$ to Earth's field)

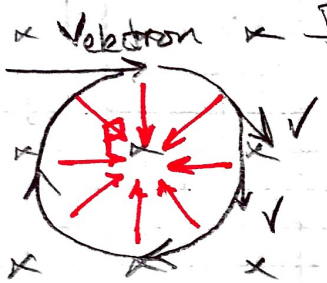
$B = 1.0e-5$ T (due to Earth's field)

Find radius of circular path.

$$F_B = qv \times B$$
$$F_c = \frac{mv^2}{r}$$

Combine

$$F_B = F_c$$
$$qvB = \frac{mv^2}{r}$$
$$r = \frac{mv}{qB}$$



$$r = \frac{(9.11e-31\,kg)(7.5e6\,m/s)}{(1.602e-19\,C)(1.0e-5\,T)}$$

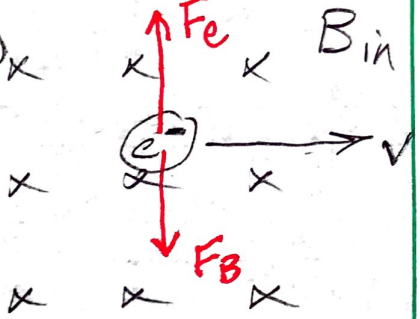
$$= \boxed{4.26\ m}$$

11.28 $B = 5.0e-5\,T$

electron has $v_\perp = 6.0e6\ m/s$ ← typo in PDF

a) Electric field is needed to keep it moving in a straight line.

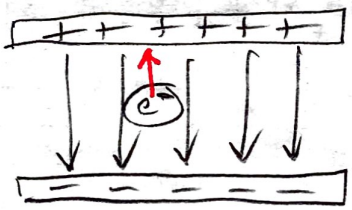
$$F_B = qvB = (1.602e-19\,C)(6.0e7\,m/s)(5e-5\,T)$$
$$= 4.81e-17\,N$$



Need F_e = that same amount

$$F_e = qE$$
$$4.81e-17\,N = (1.602e-19\,C)E$$
$$E = \boxed{300\ N/C}$$

b)



$$\Delta V = -Ed$$
$$(300)(0.010\,m)$$
$$\Delta V = \boxed{3.0\ Volts}$$