

hhh.schaums.24.32\_24.36

For a proton or an electron the magnitude of the charge is

$$q = e = 1.6 \times 10^{-19} \text{ coulombs}$$

Be sure to put all masses in kilograms

24.32 Since  $F = Eq$   
and  $F = ma$

$$ma = Eq$$

24.33 The downward pointing electric field exerts a downward force on a positive charge equal to  $Eq$ . This adds to the force of gravity ( $mg$ ). For the negative charge the force exerted by the electric field points up and thus lessens the tension on the wire.

24.34 The weight of the ball is the vertical component of force and the force due to the electric field ( $Eq$ ) is the horizontal component of the force

therefore

$$\tan \theta = \frac{Eq}{mg}$$

*This is a real common type of problem on the AP because it combines statics with electric and gravitational forces*

24.35 This is a case where you use  $v^2 = v_0^2 + 2ad$  to solve for  $a$ . Then use the fact that  $Eq = ma$  where  $q$  is  $1.6 \times 10^{-19}$  C.

24.36 This combines projectile motion with electric forces. Disregard gravitational force since they are so much smaller than electric forces.

$a = Eq/m$ . Other than that it is just a projectile motion problem