

Ch 16 #32

Start by drawing the situation, and this should help you realize that the two E-fields add up at a point directly between the two charges. This means that each charge is producing half of the net E-field value. So just use half of the net E-field to calculate the magnitude of charge that must have produced that E-field.

Ch 16 #33

Make life easier for yourself by doing a drawing and thinking about symmetry before you start the problem. You should realize that two of the charges will completely 'cancel' each other's effects, and that the other two charges will produce E-fields in the same direction. So just calculate those two fields, and add them without even thinking about components!

Ch 16 #40

Start by calculating the two E-field values, and then realize that the x-components would cancel, leaving only the y-components to combine for the net E-field. The only tricky thing is to realize that you can't calculate θ , but you can calculate $\sin\theta = \text{opp}/\text{hyp}$. The opposite side is just a , and the hypotenuse can be found with the Pythagorean theorem. Lastly, there's just some quick math to get the $3/2$ exponent, since you should have common denominators being multiplied.

Ch 16 #41a

It's just a step-by-step problem, where you find the force using the E-field, then you find the acceleration using the force, and lastly you find the final speed using the acceleration.

Ch 16 #67

Start with a force diagram, realizing that the only three forces are the tension in the string, the weight, and the electric force. Find the angle, using old pendulum ideas ($h=L-L\cos\theta$.) Find tension by using balanced y-component forces. Then find F_{electric} by using balanced x-component forces. Finish by calculating the strength (and direction, with some thinking) of the E-field.

Ch 16 #68

Start with a force diagram, including tension, weight, and F_{electric} . It shouldn't be difficult to calculate the value of F_{electric} by using equilibrium ideas, and then you can finish by finding the E-field strength and direction.