Home Work Problem Set 3

4-1 Figure 24-43 shows a thin plastic rod of length L = 12.0 cm and uniform positive charge Q = 56.1 fC lying on an x axis. With V = 0 at infinity, find the electric potential at point P1 on the axis, at distance d = 2.50 cm from one end of the rod. (HRW24-30)

4-2 The thin plastic rod shown in Fig. 24-43 has length L = 12.0 cm and a nonuniform linear charge densityλ= cx, where c = 28.9 pC/m2. With V = 0 at infinity, find the electric potential at point P1 on the axis, at distance d = 3.00 cm from one end. (HRW24-33)

4-3 Figure 24-43 shows a thin plastic rod of length L =13.5 cm and uniform charge 43.6 fC. (a) In terms of distance d, find an expression for the electric potential at point P1. (b) Next, substitute variable x for d and find an expression for the magnitude of the component Ex of the electric field at P1. (c) What is the direction of Ex relative to the positive direction of the x axis? (d) What is the value of Ex at P1 for x = d = 6.20 cm? (e) From the symmetry in Fig. 24-43, determine Ey at P1. (HRW24-38)

4-4 The thin plastic rod of length L = 10.0 cm in Fig. 24-43 has a nonuniform linear charge densityλ= cx, where c = 49.9 pC/m2. (a) With V = 0 at infinity, find the electric potential at point P2 on the y axis at y = D = 3.56 cm. (b) Find the electric field component Ey at P2. (c) Why cannot the field component Ex at P2 be found using the result of (a)? (HRW24-40)

