Sheet 5

1 Find the electric field intensity at point$(2,1,3)$ due to two charges of Q_1=5 μC and Q_2 =8 μC, at points$(3,1,2)$ and origin.

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2 A plane $y = 3$m contains a uniform charge distribution of a density $\rho_s = \left(\frac{10^{-8}}{6\pi}\right)$ C/m^2

Determine $\bar{E}$ at all points

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3 Determine $\bar{E}$ at $(x,-1,0)$ m due to a uniform sheet charge with $\rho_s = \left(\frac{1}{3\pi}\right)$ nC/m^2 is located at $z = 5$ m and a uniform line charge with $\rho_l = \left(\frac{-25}{9}\right)$ nC/m $at\ z = 3, y = 3\ m.$

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4 Three uniform sheets of surface charge density are positioned in free space as follows: Sheet #1 of ρ_{S1} = 20 nC/m^2 at x = −3, Sheet #2 of ρ_{S2} = -30 nC/m2 at y = 4 and Sheet #3 of ρ_{S2} = 40 nC/m2 at z = 2. Find the magnitude of the electric field intensity $\vec{E}$ at the three points, P_A: (4, 3, −2), P_B: (−2, 5,−1), and P_C: (0, 0, 0).

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5 A uniform surface charge density, ρ_S = 5 nC/m^2 is present in the region yz plane, −2 < y < 2, and all z. Find the electric field intensity, $\vec{E}$ at the point P(3, 0, 0).

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6 A circular disk of radius is charged uniformly with charge density, ρ_S = 20 pC / m^2 extends over the XY plane. Find the electric field intensity, Find:

a) The electric field intensity E at a point P along its axis if h = a = 1 m.

b) What is the value of this field if the radius, a becomes infinite.

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7 Find the total charge Q of the line charge extends from (2,1,5) to (4,3,6).

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8 Find the electric field (E) at the origin due to an infinite sheet of charge distribution 2nC/m2 at x=3, and infinite line of uniform charge density of 20nC/m at (1,0,4). Also find the direction of E at the point (4,5,6).