

# Answers Exam 1 2017

$$1) q_1 = \frac{8a^3 q_2}{(a^2 + b^2)^{3/2}}$$

$$2) E_x = \frac{Q}{4\pi\epsilon_0 L} \left( \frac{1}{\sqrt{L^2 + H^2}} - \frac{1}{H} \right)$$

$$E_y = \frac{Q}{4\pi\epsilon_0 H} \frac{1}{(L^2 + H^2)^{1/2}}$$

$$\vec{E} = E_x \vec{i}_x + E_y \vec{i}_y$$

$$3) \mathcal{P}_1 = 2W^2 HL$$

$$\mathcal{P}_2 = \beta HW$$

$$\mathcal{P}_3 = \frac{\gamma HLW^2}{a}$$

$$4) \text{b) } V(r) = \frac{CQ}{5((x-a)^2 + (y-b)^2)^{5/2}} + \text{const}$$

$$a) V(r) = \frac{CQ}{5r^5} + \text{const}$$