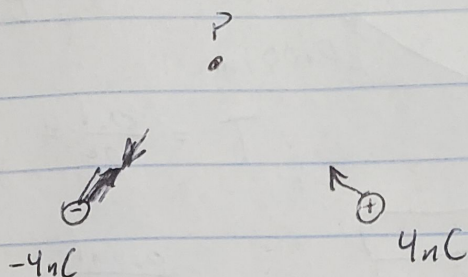
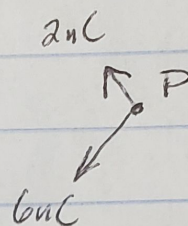


$$\vec{E} = \frac{kq}{r^2} \quad r^2 = 0.0002 \text{ m}$$



simplified



$$8.99 \text{ E}^9 \cdot 6 \text{ E}^{-9} / 0.0002 = 269700$$

$$8.99 \text{ E}^9 \cdot 2 \text{ E}^{-9} / 0.0002 = 89900$$

$$\sqrt{269700^2 + 89900^2} = \boxed{284289} = \vec{E}$$

2. $q_2 = \frac{r^2}{kq_1}$

$$0.0002 / 8.99 \text{ E}^9 \cdot 284289$$

$$= 7.8 \text{ E}^{-20} \angle 18^\circ \text{ north of east}$$

3. $\vec{F} = q\vec{E}$

$$q_e = -1.6 \text{ E}^{-19} \angle \vec{E}_{\text{max}} = 3 \text{ E}^6 \text{ N/C}$$

a. $1.6 \text{ E}^{-19} \cdot 3 \text{ E}^6 = \boxed{4.8 \text{ E}^{-13} \text{ N}}$

$$a = \frac{F}{m}$$

$$F = 4.8 \text{ E}^{-13} \text{ N} \quad m_e = 9.11 \text{ E}^{-31} \text{ kg}$$

b. $4.8 \text{ E}^{-13} / 9.11 \text{ E}^{-31} = \boxed{5.3 \text{ E}^{17} \text{ m/s}^2}$

$$V_f = V_i + at$$

$$t = \frac{V_f - V_i}{a}$$

$$V_f = 3 \text{ E}^8 \text{ m/s} \quad V_i = 0 \text{ m/s}$$

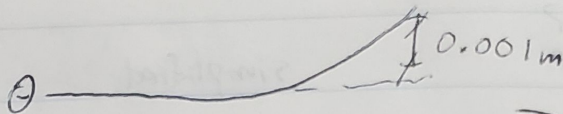
c. $3 \text{ E}^8 / 5.3 \text{ E}^{17} = \boxed{5.7 \text{ E}^{-10} \text{ s}}$

PHYS 408

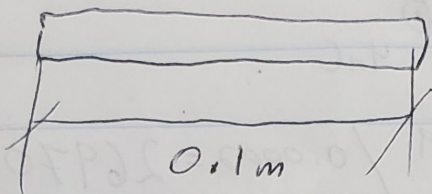
4.



$$a = \frac{v}{t}$$



$$T = \frac{0.1}{106} = 10^{-7} \text{ s}$$



$$\frac{0.001}{10^{-7}} = 10^{11} \text{ m/s}^2$$

$$F = ma$$

$$9.11 \times 10^{-31} \cdot 10^{11} = 9.11 \times 10^{-20}$$

$$E = \frac{F}{q}$$

$$9.11 \times 10^{-20} / 1.6 \times 10^{-19} = \boxed{0.57 \text{ N/C}}$$

5.

a. 28, 36 Each number is its index multiplied by itself plus one over 2.

$$b. n\left(\frac{n+1}{2}\right) = f_n \quad f_{50} = 1275$$