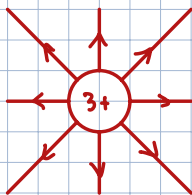
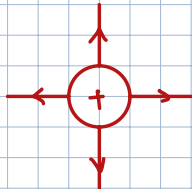


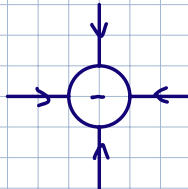
First: Electric Fields (qualitative)

①: Positive point source

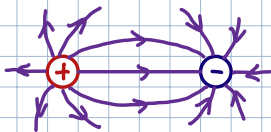


more field lines = stronger

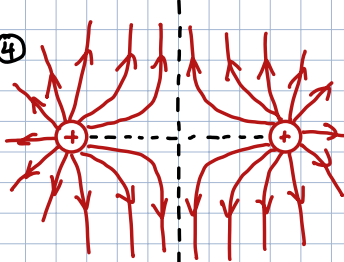
② Negative point source



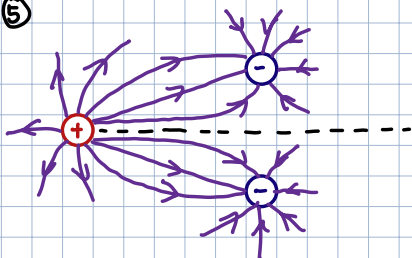
③



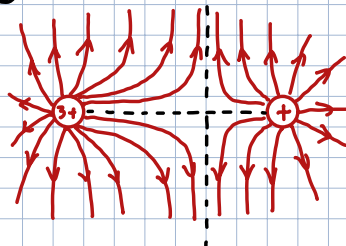
④



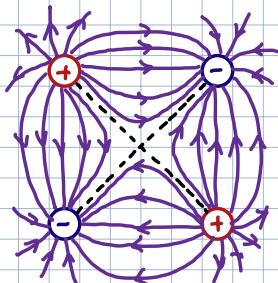
⑤



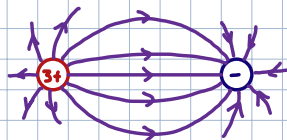
⑥



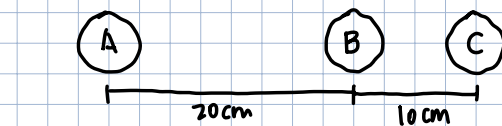
⑦



⑧



Ex 2: Charged spheres A and B are fixed in position and have charges $4 \times 10^{-6} \text{ C}$ and $-2.5 \times 10^{-7} \text{ C}$, respectively. Calculate the net force on $(6.4 \times 10^{-6} \text{ C})$



$$F_{AC} = \frac{k q_A q_C}{r_{AC}^2}$$

$$= 2.56 \text{ N [R]}$$

$$F_{BC} = \frac{k q_B q_C}{r_{BC}^2}$$

$$= 1.44 \text{ N [L]}$$

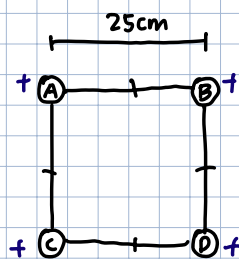


$$\Sigma F_C = F_{\text{Net}_C} = F_{BC} + F_{AC}$$

$$= 1.44 \text{ [L]} + 2.56 \text{ [R]}$$

$$= 1.12 \text{ N [R]}$$

Ex. 3 Identical spheres A, B, C and is with charge of $5 \times 10^{-6} \text{ C}$, are situated as shown. Calculate the net force on A



$$q = q_A = q_B = q_C = q_D$$

$$|F_{BA}| = |F_{CA}| = \frac{k q^2}{r_{BA}^2}$$

$$= \frac{9 \times 10^9 (5 \times 10^{-6})^2}{0.25^2}$$

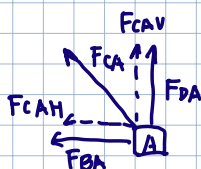
$$= 3.6 \text{ N}$$

$$r_{DA} = \sqrt{0.25^2 + 0.25^2}$$

$$|F_{DA}| = \frac{k q^2}{r_{DA}^2}$$

$$= \frac{9 \times 10^9 (5 \times 10^{-6})^2}{(0.354)^2}$$

$$= 1.8 \text{ N [UL]}$$

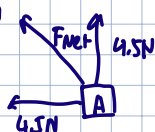


V

$$F_{\text{Net}} = F_{DAV} + F_{CA}$$

$$= 1.8 \cos 45^\circ \text{ [V]} + 3.6 \text{ [V]}$$

$$= 4.5 \text{ N [V]}$$



$$F_{\text{Net}} = \sqrt{4.5^2 + 4.5^2}$$

$$= 6.36 \text{ N [UL]}$$

H

$$F_{\text{Net}} = F_{DAH} + F_{BA}$$

$$= 1.8 \sin 45^\circ \text{ [L]} + 3.6 \text{ [L]}$$

$$= 4.5 \text{ N [L]}$$