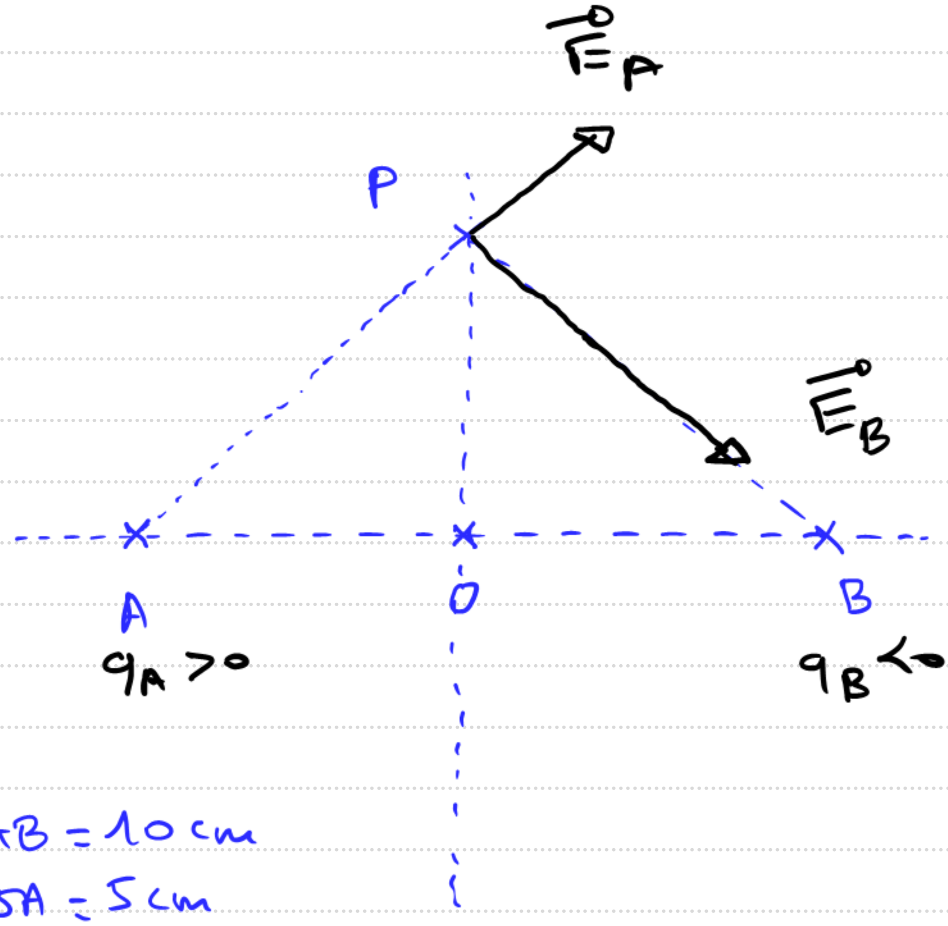
Application

1°/



AB = 10 cm
OA = 5 cm
OB = 5 cm
OP = 5 cm

$$* \; \|\vec{E}_A\| = K.\frac{|q_A|}{AP^2} = K.\frac{|q_A|}{OA^2 + OP^2}$$

$$\underline{\underline{AN}} : \|\vec{E}_A\| = 9.10^9 \times \frac{4.10^{-6}}{(0,05)^2 + (0,05)^2}$$

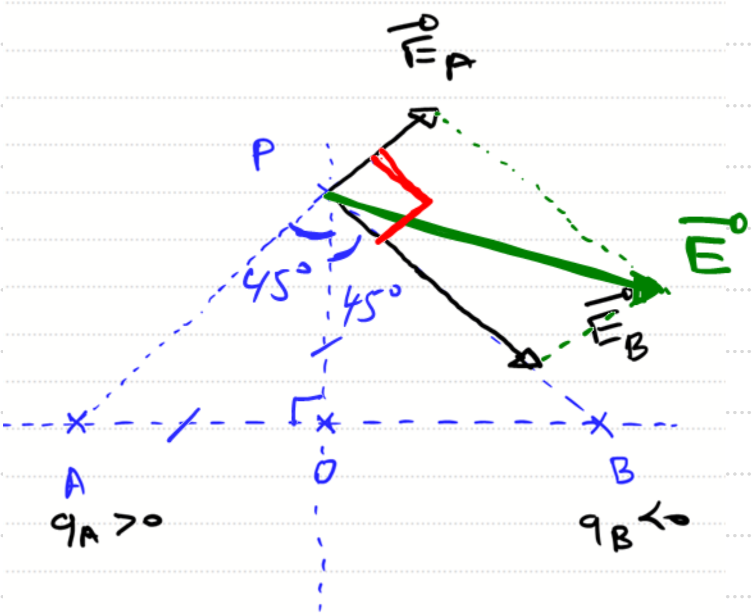
$$\|\vec{E}_A\| = \frac{9.10^9 \times 4.10^{-6}}{50.10^{-4}}$$

soit $\|\vec{E}_A\| = 72.10^5 \, N.C^{-1}$

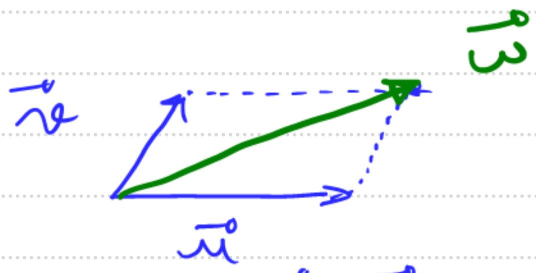
$* \quad \|\vec{E}_B\| = K . \dfrac{|q_B|}{BP^2} = K . \dfrac{|q_B|}{AP^2}$

AN : $\|\vec{E}_B\| = 9.10^9 \times \dfrac{8.10^{-6}}{50.10^{-4}}$

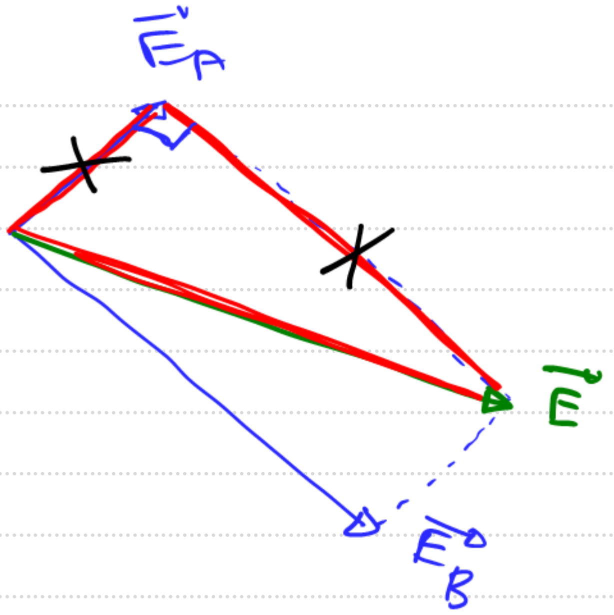
$\Rightarrow \|\vec{E}_B\| = 144.10^5 \, N.C^{-1}$



$\vec{E} = \vec{E}_A + \vec{E}_B \Rightarrow \cancel{\|\vec{E}\| = \|\vec{E}_A\| + \|\vec{E}_B\|}$



$\vec{\omega} = \vec{u} + \vec{v}$



$\|\vec{E}\| = ?$

On a un triangle rectangle

On utilise le théorème de Pythagore :

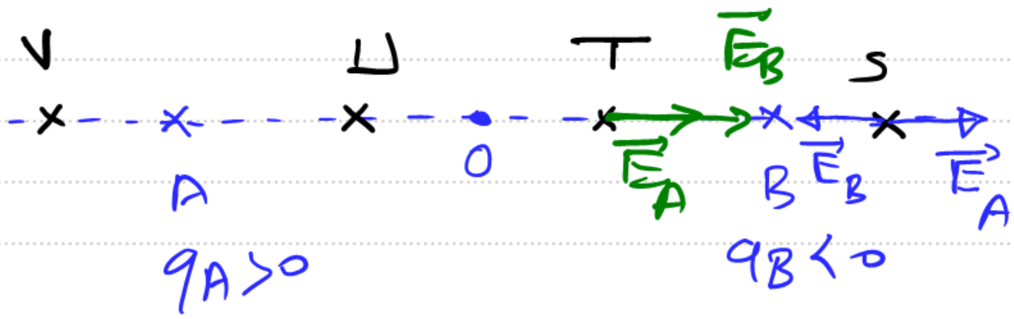
$$\|\vec{E}\|^2 = \|\vec{E}_A\|^2 + \|\vec{E}_B\|^2$$

$$\|\vec{E}\| = \sqrt{\|\vec{E}_A\|^2 + \|\vec{E}_B\|^2}$$

AN : $\|\vec{E}\| = \sqrt{(72.10^5)^2 + (144.10^5)^2}$

$\Rightarrow \|\vec{E}\| = 160,1.10^5 \ N.C^{-1}$

2°/

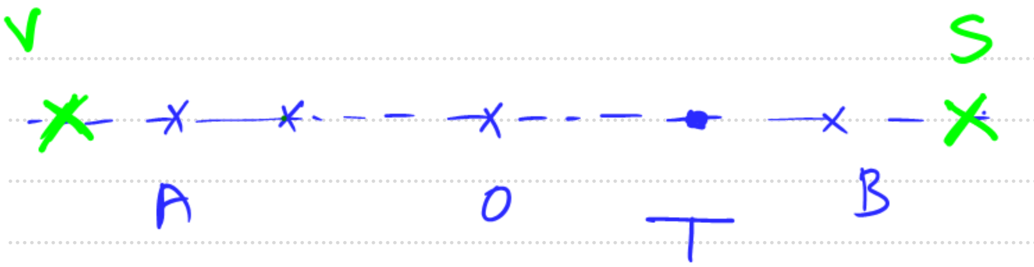


Le champ est nul

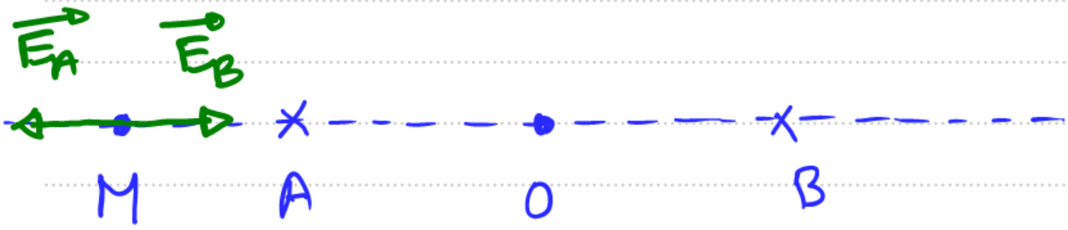
$\vec{E} = \vec{E}_A + \vec{E}_B = \vec{0}$

$\Rightarrow \vec{E}_A$ et $\vec{E}_B$ sont colinéaires

et de contraires



$q_A > 0$ $\qquad$ $q_B < 0$



MA = ?

$\vec{E}_A + \vec{E}_B = \vec{0}$

$\Rightarrow \vec{E}_A = -\vec{E}_B$

$\Rightarrow \|\vec{E}_A\| = \|\vec{E}_B\|$

$$K \cdot \frac{|q_A|}{AM} = K \cdot \frac{|q_B|}{BM}$$

$$\Downarrow$$

$$MA = ?$$