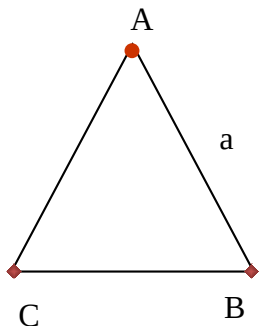
BADJI MOKHTAR UNIVERSITY -ANNABA
FACULTY OF TECHNOLOGY
SCIENCES AND TECHNOLOGY DEPARTMENT (ST)
1st year LMD 2024/2025

# Physics 2: Series 1
# Coulomb's law, electrostatic field and potential
# Additional exercises

## Exercise 5

Consider an equilateral triangle ABC with sides *a* and two charges (-2q) and (+q) in B and C.




1) Calculate the field *E* and the potential *V* created by the charges in A.

2) We place a third charge (-3q) at point A.

Deduce the force exercised on this charge.

3) Calculate the potential energy of (-3q) at point A.

Numerical application: $q=0.5.10^{-3}$ C and a=5 mm.

## Exercise 6

Two identical balls of mass m and positive charge q are suspended from the same point using a wire of length $\ell$ and form two simple pendulums.

After the repulsion each ball deviates from an angle θ.

-Find the distance r which separates them.

Data: tg θ ≈ sinθ, m = 10 g, $\ell$ = 120 cm, $q = 2{,}4.10^{-8}$ C, $K = 9.10^{9}$ $Nm^2C^{-2}$, g = 10 $m/s^2$