

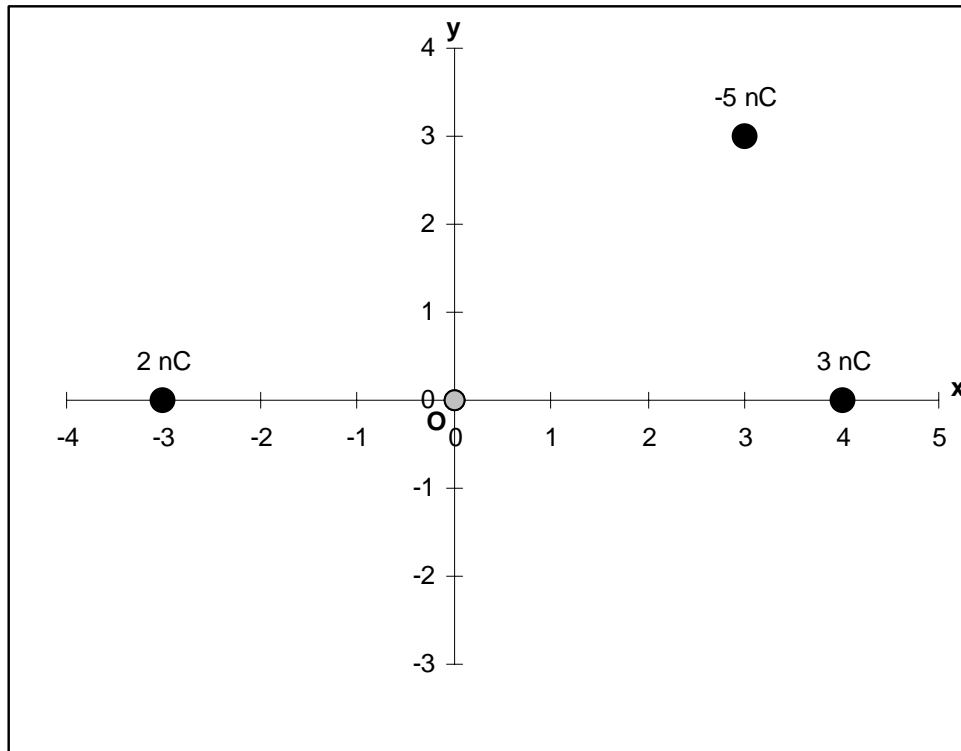
Physics 51 Proficiency Test 1(sample) (Time: 15 minutes) **25 points**
By Todd Sauke

Name _____

Section # _____

The three charges shown below as black dots are the source of an electric field. The coordinates are measured in meters, and the charges are as indicated in units of nano-Coulombs ($\text{nC} = 10^{-9} \text{ C}$). Find the magnitude and direction of the electric field vector at the origin, **O**. Pay particular attention to the sign of all quantities.

Use $k = 1/(4 \pi \epsilon_0) = 9.0 \times 10^9 \text{ N m}^2/\text{C}^2$.



x-component at **O** = _____ N/C y-component at **O** = _____ N/C

Magnitude of **E** field at **O** _____ N/C Direction of **E** field at **O** _____ °
(relative to +x axis)