**Name:** _____ **Class:** _____ **Date:** _____ **ID: A**

# AP Physics 2 - Ch 16 Practice

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. A +15-nC point charge is placed on the $x$ axis at $x$ = 1.5 m, and a –20-nC charge is placed on the $y$ axis at $y$ = –2.0m. What is the magnitude of the electric field at the origin?
a. 105 N/C b. 15 N/C c. 75 N/C d. 45 N/C e. 60 N/C

____ 2. A +20-nC point charge is placed on the $x$ axis at $x$ = 2.0 m, and a –25-nC point charge is placed on the $y$ axis at $y$ = –3.0 m. What is the direction of the electric field at the origin?
a. 209° b. 61° c. 29° d. 241° e. 151°

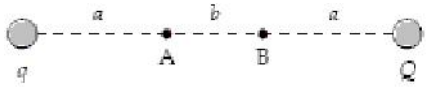
____ 3. A 40-«C charge is positioned on the $x$ axis at $x$ = 4.0 cm. Where should a –60-«C charge be placed to produce a net electric field of zero at the origin?
a. –5.3 cm b. 5.7 cm c. 4.9 cm d. –6.0 cm e. +6.0 cm

____ 4. A particle (m = $6.7 \times 10^{-27}$ kg, charge = $3.2 \times 10^{-19}$ C) moves along the + $x$ axis with a speed of $4.8 \times 10^{5}$ m/s. It enters a region of uniform electric field parallel to its motion and comes to rest after moving 2.0 m into the field. What is the magnitude of the electric field?
a. 2.0 kN/C b. 1.5 kN/C c. 1.2 kN/C d. 3.5 kN/C e. 2.4 kN/C

____ 5. A proton (mass = $1.67 \times 10^{-27}$ kg, charge = $1.60 \times 10^{-19}$ C) moves from point A to point B under the influence of an electrostatic force only. At point A the proton moves with a speed of 50 km/s. At point B the speed of the proton is 80 km/s. Determine the potential difference $V_B - V_A$.
a. +20 V b. –20 V c. –27 V d. +27 V e. –40 V

____ 6. An electron ($m = 9.1 \times 10^{-31}$ kg, $q = -1.6 \times 10^{-19}$ C) starts from rest at point A and has a speed of $5.0 \times 10^{6}$ m/s at point B. Only electric forces act on it during this motion. Determine the electric potential difference $V_A - V_B$.
a. –71 V b. +71 V c. –26 V d. +26 V e. –140 V

____ 7. If $a$ = 30 cm, $b$ = 20 cm, $q$ = +2.0 nC, and $Q$ = –3.0 nC in the figure, what is the potential difference $V_A - V_B$?




a. +60 V b. +72 V c. +84 V d. +96 V e. +48 V

____ 8. Identical 2.0-«C charges are located on the vertices of a square with sides that are 2.0 m in length. Determine the electric potential (relative to zero at infinity) at the center of the square.
a. 38 kV b. 51 kV c. 76 kV d. 64 kV e. 13 kV

____ 9. Four identical point charges (+4.0 «C) are placed at the corners of a square which has 20-cm sides. How much work is required to assemble this charge arrangement starting with each of the charges a very large distance from any of the other charges?
a. +2.9 J b. +3.9 J c. +2.2 J d. +4.3 J e. +1.9 J

____ 10. Through what potential difference must an electron (starting from rest) be accelerated if it is to reach a speed of $3.0 \times 10^{7}$ m/s?
a. 5.8 kV b. 2.6 kV c. 7.1 kV d. 8.6 kV e. 5.1 kV

# AP Physics 2 - Ch 16 Practice
# Answer Section

## MULTIPLE CHOICE

1. C
2. A
3. C
4. C
5. B
6. A
7. A
8. B
9. B
10. B