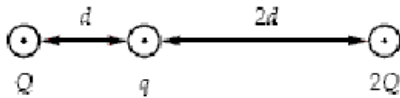


AP Physics 2 - Chapter 15 Practice

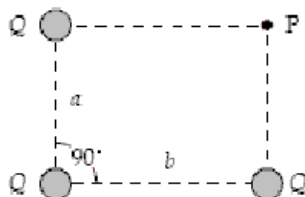
Multiple Choice

Identify the choice that best completes the statement or answers the question.

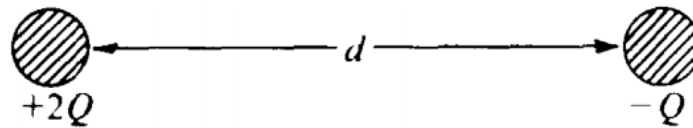
- _____ 1. In the figure, if $Q = 30 \mu\text{C}$, $q = 5.0 \mu\text{C}$, and $d = 30 \text{ cm}$, what is the magnitude of the electrostatic force on q ?



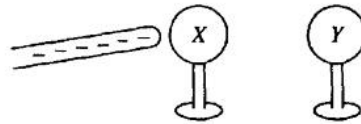
- a. 15 N b. 23 N c. zero d. 7.5 N e. 38 N
- _____ 2. A particle ($m = 50 \text{ g}$, $q = 5.0 \mu\text{C}$) is released from rest when it is 50 cm from a second particle ($Q = -20 \mu\text{C}$). Determine the magnitude of the initial acceleration of the 50-g particle.
- a. 54 m/s^2 b. 90 m/s^2 c. 72 m/s^2 d. 65 m/s^2 e. 36 m/s^2
- _____ 3. A point charge Q is placed on the x axis at $x = 2.0 \text{ m}$. A second point charge, $-Q$, is placed at $x = 3.0 \text{ m}$. If $Q = 40 \mu\text{C}$, what is the magnitude of the electrostatic force on a $30\text{-}\mu\text{C}$ charge placed at the origin?
- a. 7.2 N b. 3.9 N c. 1.5 N d. 14 N e. 8.1 N
- _____ 4. If $Q = 16 \text{ nC}$, $a = 3.0 \text{ m}$, and $b = 4.0 \text{ m}$, what is the magnitude of the electric field at point P?



- a. 33 N/C b. 31 N/C c. 24 N/C d. 19 N/C e. 13 N/C
- _____ 5. A $40\text{-}\mu\text{C}$ charge is positioned on the x axis at $x = 4.0 \text{ cm}$. Where should a $-60\text{-}\mu\text{C}$ 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. $+6.0 \text{ cm}$

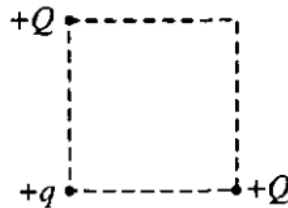


7. Two identical conducting spheres are charged to $+2Q$ and $-Q$, respectively, and are separated by a distance d (much greater than the radii of the spheres) as shown above. The magnitude of the force of attraction on the left sphere is F_1 . After the two spheres are made to touch and then are re-separated by distance d , the magnitude of the force on the left sphere is F_2 . Which of the following relationships is correct?
 (A) $2F_1 = F_2$ (B) $F_1 = F_2$ (C) $F_1 = 2F_2$ (D) $F_1 = 8 F_2$



51. Two metal spheres that are initially uncharged are mounted on insulating stands, as shown above. A negatively charged rubber rod is brought close to, but does not make contact with, sphere X. Sphere Y is then brought close to X on the side opposite to the rubber rod. Y is allowed to touch X and then is removed some distance away. The rubber rod is then moved far away from X and Y. What are the final charges on the spheres?

<u>Sphere X</u>	<u>Sphere Y</u>
A) Zero	Zero
B) Negative	Positive
C) Positive	Negative
D) Positive	Positive

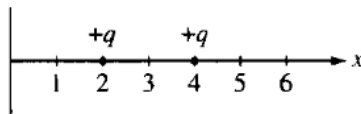


53. As shown above, two particles, each of charge $+Q$, are fixed at opposite corners of a square that lies in the plane of the page. A positive test charge $+q$ is placed at a third corner. What is the direction of the force on the test charge due to the two other charges?

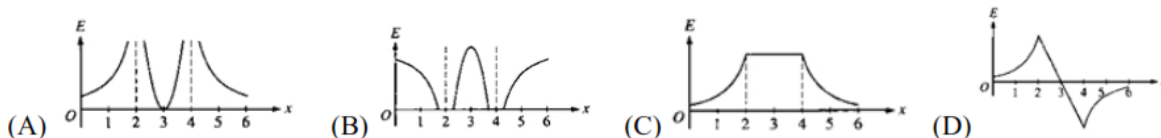
- (A) (B) (C) (D)

54. If F is the magnitude of the force on the test charge due to only one of the other charges, what is the magnitude of the net force acting on the test charge due to both of these charges?

- (A) Zero (B) $\frac{F}{\sqrt{2}}$ (C) $\sqrt{2}F$ (E) $2F$



59. Two charged particles, each with a charge of $+q$, are located along the x -axis at $x = 2$ and $x = 4$, as shown above. Which of the following shows the graph of the magnitude of the electric field along the x -axis from the origin to $x = 6$?



**AP Physics 2 - Chapter 15 Practice
Answer Section**

MULTIPLE CHOICE

1. D
2. C
3. C
4. C
5. C
7. D
51. C
53. D
54. D
59. A