

Name _____

Show your work, and circle your answers and use sig figs to receive full credit.

$$F_G = G \frac{m_1 m_2}{r^2} \quad F_E = k \frac{q_1 q_2}{r^2} \quad \text{- Inverse square force laws}$$

1. What is the force of attraction between a $-10.1 \mu\text{C}$ charge and a $+34.1 \mu\text{C}$ charge if their centers are 67.0 cm apart? Is it a force of attraction or repulsion?

2. At what distance is the force of repulsion between a 2.00 C charge and a 3.00 C charge equal to 4.45 N (1 pound of force, or 16 ounces of force)

3. What is the force of gravity between a 23.0 kg object on the surface of the moon. The moon has a mass of $7.35 \times 10^{22} \text{ kg}$, and a radius of $1.738 \times 10^6 \text{ m}$.

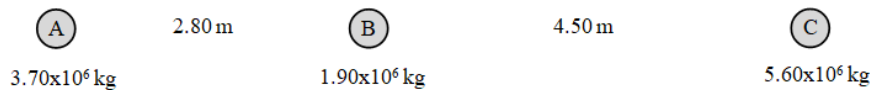
4. $450. \text{ Kg}$ wrecking ball experiences a force of attraction of $6.30 \times 10^{-10} \text{ N}$ to a metal sphere that is 15.0 m away. What is the mass of the sphere?

5. Two point masses have a force of attraction of $2.30 \times 10^{-12} \text{ N}$ when they are separated by 56.0 cm . What is their separation if the force of attraction is $5.80 \times 10^{-12} \text{ N}$?

6. Two point charges have a force of repulsion of 45.3 N when they are 2.30 m separated. What is the force of repulsion if they are separated by only 1.25 m ?

7. Two point charges attract each other with a force of 1.40 N when they are 2.20 m apart. How far apart are they if the force of attraction is 5.60 N ?

8. Find the net force and direction on masses A, B and C:

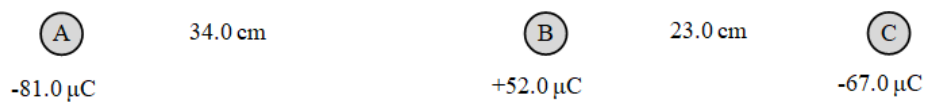


A = _____

B = _____

C = _____

9. Find the net force and direction on charges A, B and C:

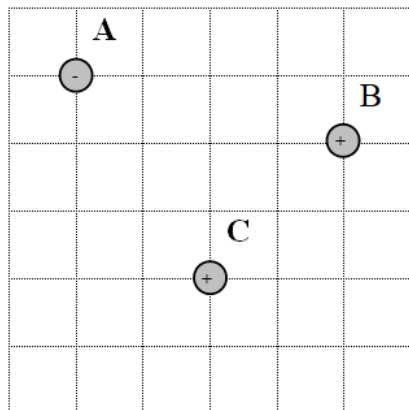


A = _____

B = _____

C = _____

10. Each grid line is a meter. Charge A is $-430. \mu\text{C}$, and charge B is $+120. \mu\text{C}$, and C is $+780. \mu\text{C}$. Calculate the force on charge C. Draw the force vector and label its magnitude and direction.



11. Each grid line is a meter. Mass A is $1.20 \times 10^6 \text{ kg}$, and mass B is $3.10 \times 10^6 \text{ kg}$, and C is $6.80 \times 10^6 \text{ kg}$. Calculate the force on mass A. Draw the force vector and label its magnitude and direction.

