SP – C Additional Problems

Name: _____

1. Consider two charges, q_1 = 2.90 nC and an unspecified charge, q_2, are separated 5.65 m. A third charge of 1.2 nC is placed 1.40 m away from q_1. If the net electric force on this third charge is zero, what is q_2? (1)

Answer: _____

3. Earth's mass is about 6.0×10^{24} kg while the mass of Mars about is 6.39×10^{23} kg. What equal charges must be placed on Earth and Mars to make the net force between them zero? (3)

Answer: _____

7. Consider two charges, q_1 = 4.0 C and q_2 = 10.0 C, separated by 2000000 km. A third charge, q_3 = 5.5 C, is placed on the line connecting q_1 *and* q_2. How far from q_1 should q_3 be placed for q_3 to be in equilibrium? (7)

Answer: _____

8. A 55 μC charge and a 150 μC charge are separated by 89 m. Where must a 14.9 μC charge be placed between these other two charges in order for the net electric force on it to be zero? (8)

Answer: _____

13. An object with a mass of 15.0 grams is resting on a horizontal surface. It is known that if the object is given a charge of 2.2 μC and a charge of at least –9.0 μC is placed on that surface at a distance of 1.5 m from it, then the object will barely keep from sliding. Calculate the coefficient of static friction between the object and the surface. (13)

Answer: _____