

2.5.20

Electricity: Statics Math

Today's Objectives:

- Review scientific notation
- Use $Q = ne$ to calculate electric charge
- Calculate conducting sphere problems



Scientific Notation - easy way to write

1 million = 1,000,000 big or small numbers

$$1 \times 10^6 = 1E6$$

+ exponent: Big #

- exponent: Small #

$$8.5 \boxed{EE} 6$$

(Note: '2nd' is written below the box)

$$8.5 \times 10^6 * 9.9 \times 10^5 =$$

$$8.415 E 12$$
$$8.415 \times 10^{12}$$

$$6.85 \times 10^5 * 2.50 \times 10^{-6}$$



$$1.7125$$

$$Q = n * e$$

Q = Charge (coulomb)

n = number of electrons added or removed

$$e = 1.6 \times 10^{-19}$$

1) An object has 1×10^{21} electrons taken away from it. What is its charge?

$$n = 1 \times 10^{21}$$

$$e = 1.6 \times 10^{-19}$$

$$Q = ?$$

$$Q = n e$$
$$= (1 \times 10^{21})(1.6 \times 10^{-19})$$

$$Q = +160 \text{ C}$$

2) An object has an excess of 5×10^{20} electrons, what is the charge on it?

$$n = 5 \times 10^{20}$$

$$e = 1.6 \times 10^{-19}$$

$$Q = n e$$
$$(5 \times 10^{20})(1.6 \times 10^{-19})$$

$$-80 \text{ C}$$

Conducting Spheres - take the average!

add Q & divide by 2.

What charge results from these spheres being touched?

a) +3C, -1C $\frac{3+(-1)}{2} = \frac{2}{2} = +1C$

b) +10C, -12C $\frac{-2}{2} = -1C$

c) +6C, -6C $0C$ (Neutral)

d) 0C, +8C

e) 0C, 0C

+4C
0C

