

$$F_g = \frac{Gm_1m_2}{r^2}$$

Law of Gravitation – Worksheet

G: Gravitational constant ($6.67 \times 10^{-11} \text{ Nxm}^2/\text{kg}^2$)

FOR SCIENTIFIC NOTATION, WRITE YOUR ANSWER IN THE FOLLOWING FORMAT:

$2.3 \times 10^{-3} = 2.3\text{EXP-3}$

1. Two subway trains, each of mass $4.0 \times 10^5 \text{ kg}$, are located with their centers of mass 8.0 m apart. What gravitational force exists between them?

2. An 80 kg boy and a 60 kg girl are 2 meters apart. What is the gravitational force of attraction between them?

3. What is the gravitational force of attraction between two $1\,000.0 \text{ kg}$ automobiles which are 5.00 m apart?

4. Two trucks are parked next to each other. Their centers of gravity are 10 meters apart. One truck weighs $8.0 \times 10^5 \text{ N}$. The other weighs $6.0 \times 10^4 \text{ N}$. What gravitational force exists between them? (Assume $g = 10 \text{ m/s}^2$)

5. In a hydrogen atom, an electron and a proton are $1.00 \times 10^{-10} \text{ m}$ apart. What is the gravitational force of attraction between them?
 - *Note:* Mass of electron = $9.11 \times 10^{-31} \text{ kg}$
 Mass of proton = $1.67 \times 10^{-27} \text{ kg}$