April 23, 2018

1) Review Inertia, Gravitational Force

2) Practice problems with force of gravity

Gravitational Force

Terms to know:

- Mass : measure of amount of matter. (Kg)
- Weight : measure of the force of gravity. (Newton)
- Acceleration due to gravity

$$F_g = mg$$

F_g = Force of gravity (weight) (N)

m = mass (kg)

g= acceleration due to gravity (m/s^2)

Mass is constant throughout the universe, but weight changes depending on where you are.

g varies depending on....

- the mass of the planet

- distance to planet

i.e. On earth g = 9.81m/s^2

On the moon g = 1.64m/s^2

see Physics handbook handout Table 4.4 and 4.3

Force of Gravity Practice Problems

1. Calculate the force of gravity on a 45 kg mass located at the peak of Mt. Everest.

m = 45kg
g= 9.7647 m/s^2

Fg=mg
Fg= (45)(9.7647)
Fg= 439N

2. At the equator a person has a weight of 1075 N, calculate his mass.

Fg=1075N

g= 9 .7805 m/s^2

Fg = mg
1075 =m9.7805
9.7805 9.7805
110kg=m

3. How many times stronger is the force of gravity at the bottom of the Mariana Trench than on the ISS? (assume the same object at each location)

$F_{gtrench}$ =9.8331m/s^2

F_{gISS} = 9.0795m/s^2

$\frac{F_{gt}}{F_{gISS}}$ = 1.09

*Unless given a specific location, take the g = 9.81 m/s$_2$ for an object located anywhere on the Earth.

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