Cheatography

Gravitation Cheat Sheet

by Ayesha Talib via cheatography.com/173447/cs/36695/

UNIVERSAL LAW OF GRAVITATION

every object in the universe attracts every other object with a force which is proportional to the product of their masses and inversely proportional to the square of the distance b/w them.

$6.673.10^{-11} Nm^2kg^{-2}$; Henry Cavendish using a sensitive balance.

IMPORTANCE

force that binds us to earth; motion of moon around earth; motion of planets around sun; tides due to moon and sun.

ACCELERATION DUE TO GRAVITY

acceleration experienced by a freely falling object towards the centre of the earth. 9.8 m/s^2.

$E^R > P^R = E^g < P^g$

free fall: it is the object falling towards the earth under the influence of attraction force earth/gravity.

MASS Λ WEIGHT

quantity/amount of matter present in an object	force by which earth attracts an object
scalar quantity	vector quantity
SI unit: kg	SI unit: N
remains constant everywhere	changes as gravity changes
can never be 0	0 at the centre of earth

$W^M = 1/6\ W^E$

CELESTIAL BODIES: MASS & RADIUS

earth	$5.98.10^{24}kg$	$6.37.10^6m$
moon	$7.36.10^{22}kg$	$1.74.10^6m$

THRUST

force acting on an object perpendicular to the surface.

PRESSURE

thrust on unit area. SI unit: Pa or N/m^2

BUOYANT FORCE OR UPTHRUST

tendency of fluids to exert upward force on an immersed object.

factors affecting buoyant force

volume of the object immersed in fluid

density of fluid

acceleration due to gravity

temperature of fluid$^{\text{inversely proportional}}$

FLOAT:

upthrust > weight of object

^{d}fluid > ^{d}object

SINK:

upthrust < weight of object

^{d}fluid < ^{d}object

density of substance is the mass per unit volume.

ARCHIMEDES' PRINCIPLE

when a body is immersed fully or partially in a fluid, it experiences an upward force that is equal to the weight of the fluid displaced by it.

used in designing submarines & ships, lactometers & hydrometers.

lactometers: determine the purity if a sample of milk.

hydrometers: determine the density of liquids.

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