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Solar System Facts (MKS units):

Part A:

Where;

g_s = Gravity of Sun

g_m = Gravity of planet Mercury

g_v = Gravity of planet Venus

g_e = Gravity of planet Earth

g_{ma} = Gravity of planet Mars

g_j = Gravity of planet Jupiter

And so on..

D = It is the average distance between the Sun and the Planet in question

G^o = Gravitational Force Number = 10^{-16}

Assumptions: The gravitational force between planets is miniscule as compared to SUN and Planets and hence has been ignored.

Now;

F_{SM} = Gravitational Force between Sun and Mercury

F_{SV} = Gravitational Force between Sun and Venus

F_{SE} = Gravitational Force between Sun and Earth

F_{SMa} = Gravitational Force between Sun and Mars

F_{SJ} = Gravitational Force between Sun and Jupiter

$F_{S?}$ = Gravitational Force between Sun and so on…

Formula:

$$F_{SM} = \frac{\text{Gravity of Sun x Gravity of planet Mercury } g_s \times g_m}{D2 \quad D2}$$

$$= \text{----------}$$

F_{SM} = **48.18x10-16**

F_{SV} = **28.88x10-16**

F_{SE} = **14.13x10-16**

F_{SMa} = **2.31x10-16**

F_{SJ} = **1.12x10-16**

Or

F_{SM} = **48.18 Gº**

F_{SV} = **28.88 Gº**

F_{SE} = 14.13 Gº

F_{SMa} = 2.31 Gº

F_{SJ} = 1.12 Gº

In a given solar system if the product $F_{S?}$ is larger than 14.13 Gº and for sure equal to 28.88 Gº then that planet of the star can not have moon around it. Moon(s) will be sucked in by the star (Sun)!

In a given solar system the product $F_{S?}$ Has to be less than or equal to 14.13 Gº so that planet of the star can have moon(s).

As the product $F_{S?}$ Becomes smaller and smaller the planet can have more than one moon around it.

Part B:

It is possible to calculate through complex calculations the time it would take for the planet Mercury to fall into Star (Sun). Millions of years ago planets and moons have fallen into the Sun!

The trajectory of each planet around the Sun (star) is spiral in nature, which ends in SUN (star)

Once the rate of increase of $F_{S?}$ is known it would be possible to calculate End Time of a particular planet

$\frac{d}{dt}(F_{S?})$ = Rate of Change of $F_{S?}$ With time

$e^{-k (Fs?) t}$ = Decay Time of the planet

where k is the constant depends upon mass of the planet.

Best Shots