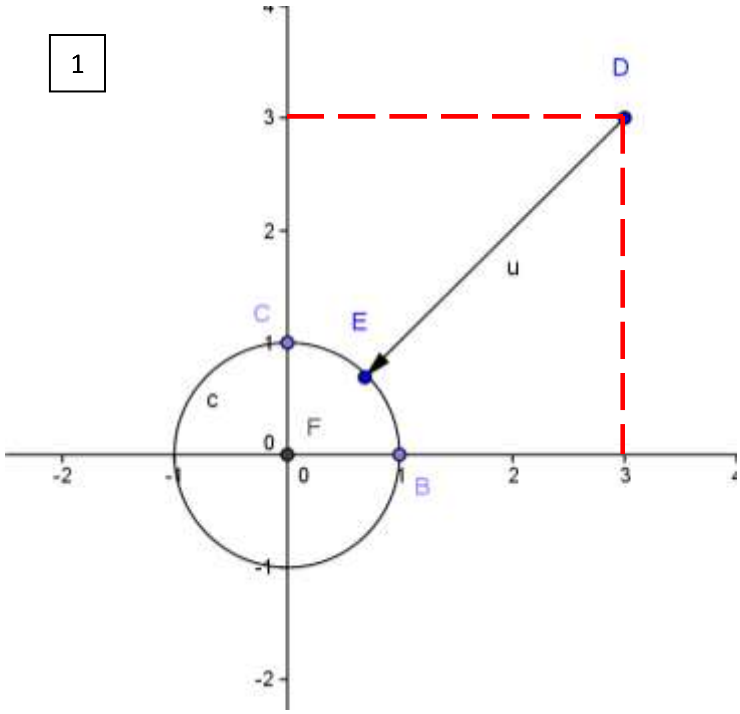
EXPLANATIONS FOR SLIDE 1:

1



1. UNIT SQUARE SPACE TIME FOR CONSTANT ACCELERATION CURVATURE POINT MASS [F]

FINDING ACCELERATION CURVATURE OF POINT MASS (**F**).

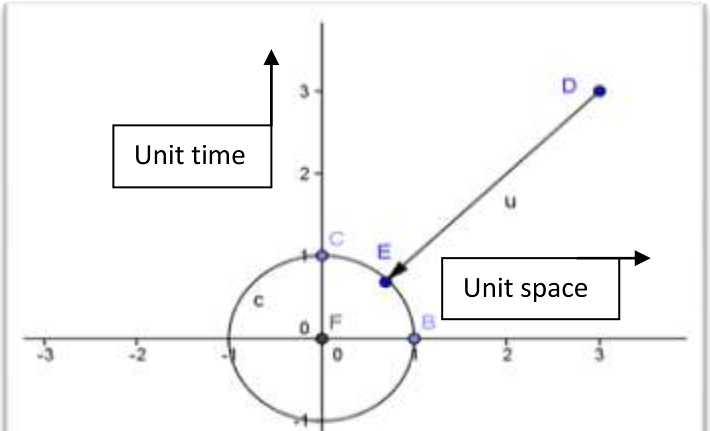


Figure 2: Constant Acceleration Space Time Square

Let point (D) be an object in the space above the surface acceleration curvature of a mass/volume ratio of a given point mass (**F**). Position of (D) is sufficient to allow <u>one second</u> of free fall through the space above surface curvature of (**F**).

If (D) were dropped in the gravity field of our earth, the magnitude of vector (u) would be 16 feet or 4.9 meters.

Let this magnitude be initial preliminary Cartesian space time definition for acceleration phenomena (gravity field rate of fall) of point mass earth. The acceleration *curvature* of a point mass for our planet Earth would then be the inverse of magnitude $(\overline{ED})$, $\left(\frac{1}{16}\right)$ "feet" or $\left(\frac{1}{4.9}\right)$ "meters".

Some minor changes of Cartesian convention concerning traditional graph need be addressed before we can determine acceleration potential of position in a g-field.

<u>Necessary Cartesian changes.</u>

1. Unit circle center becomes **F**; zero will no longer reside here.
2. Let traditional (**y**) become unit time and (**π/2 and 3π/2**) direction radius (system spin axis).
3. Let traditional (**x**) become unit space and (**π and 2π**) direction radius (system plane of rotation).

ON USING ACCELERATION CURVATURE OF A POINT MASS CENTER WITHIN A **CSDA** PLATFORM TO METER CHANGING SYSTEM POSITION POTENTIAL WITH RESPECT TO [**F**].

A **CSDA** platform is an acronym for the two plane geometry curves used by the Sand Box to construct a gravity field orbital. The acronym stands for (**CURVED SPACE DIVISION ASSEMBLY©**) and both these curves will be used to partition space into gravity field zones of controlled and controller. Such composition will meter changing field potential of position with respect to field center. A circle will be the independent component having one and only one center as opposed to duo foci of current systems. A plane geometry parabola will be the dependent curve and possess one and only one focus which coincides with independent center of the circle. This is what makes a Sandbox Geometry **CSDA** work, the parabola focus and circular center are one and the same. Parabola foci will be used to meter changing energy required by and for motion beyond the surface curvature of system center and independent circular center will be used to meter effective surface acceleration of system surface curvature with respect to system center.

Once we make point mass acceleration curvature relative with point mass spherical surface acceleration curvature we can assign a name to the unit circles used to meter acceleration curves resulting from such manipulation. Such circles will be known as (**ASI**) Acceleration Sphere of Influence. **ASI's** will represent "fixed" position constant acceleration phenomena needed to meter gravity field central force position potential with respect to [**F**]. What mathematics would call an instantaneous assessment.

ASI Relativity.

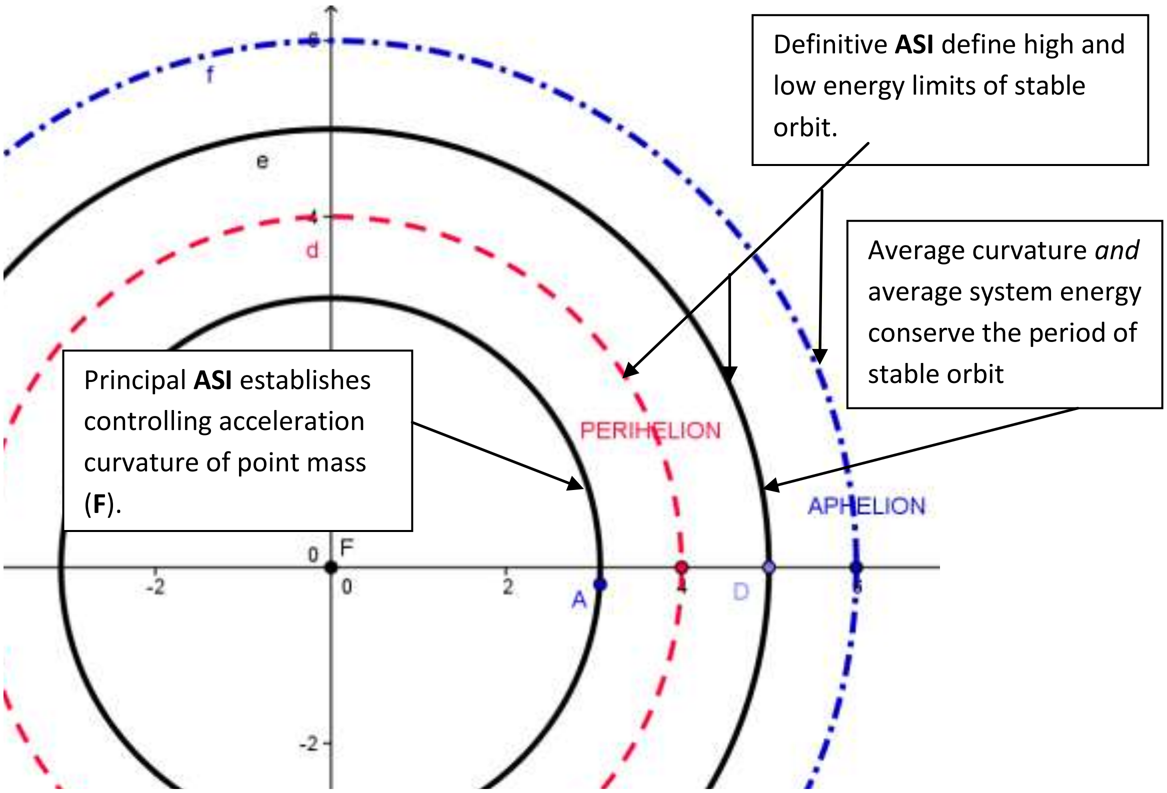


Figure 3: Attributes of specific acceleration spheres of influence (**ASI**).

FIELD SPACE THEOREM 1: EVERY POINT AROUND THE ACCELERATION CURVATURE OF POINT MASS [F] BUILDING A GRAVITY FIELD ORBITAL IS A POSITION VECTOR OF [F].
This theorem is self evident. A position vector is an origin vector and **F** is Newtonian center. The center **F** has a straight line through space connecting any point unto its influence. Such a straight line makes any point in the space occupied by **F**, a radial displacement from **F**.

FIELD SPACE THEOREM 2: THE ACCELERATION EXPERIENCE OF ANY POSITION VECTOR OF F VARIES AS THE SQUARE OF CURVATURE.
This theorem assigns the magnitude of the position vector as the radius of definition for inverse square experience, essentially the square of curvature. Acceleration experience is derived from Sir Isaac Newton's Universal Law of Gravity.

FIELD SPACE THEOREM 3: EVERY POINT SURROUNDING THE ACCELERATION CURVATURE OF [**F**] IS A MEMBER OF A SUB-SET OF POINTS HAVING EQUAL ACCELERATION EXPERIENCE. THIS SUB-SET OF POINTS WILL FORM A LOCUS DEFINING A SPHERICAL SURFACE OF INFLUENCE ABOUT THE ACCELERATION CURVATURE OF ANY POINT MASS [**F**].

Constructing an ASI: Since any position vector is essentially a radius from [**F]** by Field Space Theorem 1, this radius can be used to define a semi-circle on the spin axis with [**F]** as center. The revolution of this semi-circle will produce the spherical surface required by an **ASI** to meter constant acceleration curves of [**F]**.

The concept of an **ASI** is based on Field Space; Theorem 3. Any point in field space is a radial displacement from [**F],** and every one of them is a position vector controlled by [**F**]. All these collective points surrounding [**F**] have family connectivity as member of an infinite sub set of position vectors all sharing equivalent displacement (and equivalent acceleration experience) from Newtonian center as part of a locus defining a spherical surface of points in the space surrounding [**F]**. An **ASI** is to field space, what a straight line segment is to plane geometry, a basis to measure position curvature.

If one **ASI** is a base of field measure, displacement in field space is the comparative of two **ASI's**. I intend to use two **ASI**'s as "bookend" limit definition of orbit period. Since acceleration changes **K.E.** of orbit, there is a sense of intensity with the descriptive utility of **ASI** acceleration experience. The highest intensity **ASI** is always the closest to **F**, holding greater **K.E.** of orbit limit, and the **ASI** of lower intensity is always the more distant, recording the lesser **K.E.** of orbit limits. All **ASI** found between the orbit energy limits of perihelion and aphelion are **DEFINITIVE ASI,** and will record changing spherical shape of an orbit as the loci drawn by **RT** focal radii, field dependent curves.

SUMMARY:
The **PRINCIPAL ASI** is the independent spherical composition of constant acceleration structuring the gravity field orbital. The radius of the independent **PRINCIPAL ASI** [***r***] is equal to [***p***] of its construct dependent unit parabola. Focal radii definition of energy structured motion found as limits of perihelion and aphelion are constructed on the **RT** and are time sensitive having arc length (period/2).

Principal ASI is independent controlling acceleration curvature of system center**.** For constant acceleration systems it will be surface acceleration curvature controlled by a point mass (**F**) mass/volume ratio *and* magnitude of space considered.

Definitive ASI will be used to sample position potential with respect to system center. Changing acceleration systems require three definitive curves. High energy, low energy, and system average to compose stable orbit *and* period of motion.

We will now move to a plane geometry meter of system potential realized by change of position in a constant acceleration environment

GIVEN:

- Let acceleration curvature of planet earth point mass be: $\left(\frac{1}{16}\text{"}feet\text{"}\right)$ or $\left(\frac{1}{4.9}\text{"}meter\text{"}\right)$.
- Find impact velocity and time to impact for an object 400 feet above the earth's surface.

Use *Mathematica* to build a table of displacement free fall per unit second. Acceleration values for earthly standard and metric systems are: $\left(32\frac{\text{ft}}{\text{sec}^2}\right)$ and$(9.8\frac{m}{\text{sec}^2})$.

(free fall distance (s) to surface) $s = \frac{1}{2}\text{at}^2$

$$\text{Table}\left[\frac{1}{2}\left(32\frac{\text{ft}}{\text{sec}^2}\right)\left(t(\text{sec})\right)^2, \{t, 1,10,1\}\right] \xrightarrow{yields}$$

$$\{16\text{ft}, 64\text{ft}, 144\text{ft}, 256\text{ft}, 400\text{ft}, 576\text{ft}, 784\text{ft}, 1024\text{ft}, 1296\text{ft}, 1600\text{ft}\} \xrightarrow{yields}$$

1sec	2	3	4	5	6	7	8	9	10sec
16ft	64	144	256	400	576	784	1024	1296	1600ft

A table for meters per second free fall.

$$\text{Table}[\frac{1}{2}(9.8\frac{m}{\text{sec}^2})(t(\text{sec}))^2, \{t, 1,10,1\}] \xrightarrow{yields}$$

$$\{4.9m, 19.6m, 44.1m, 78.4m, 122.5m, 176.4m, 240.1m, 313.6m, 396.9m, 490.\,m\} \xrightarrow{yields}$$

1sec	2	3	4	5	6	7	8	9	10sec
4.9m	19.6	44.1	78.4	122.5	176.4	240.1	313.6	369.9	490m

We will now use *Mathematica* to construct a table collecting impact velocity of free fall per unit time.

$$v = \text{at}$$

$$\text{Table}[(32\frac{\text{ft}}{\text{sec}^2})(t(\text{sec})),\{t,1,10,1\}]$$

$$\{\frac{32\text{ft}}{\text{sec}},\frac{64\text{ft}}{\text{sec}},\frac{96\text{ft}}{\text{sec}},\frac{128\text{ft}}{\text{sec}},\frac{160\text{ft}}{\text{sec}},\frac{192\text{ft}}{\text{sec}},\frac{224\text{ft}}{\text{sec}},\frac{256\text{ft}}{\text{sec}},\frac{288\text{ft}}{\text{sec}},\frac{320\text{ft}}{\text{sec}}\}\xrightarrow{yields}$$

1sec	2	3	4	5	6	7	8	9	10sec
$\frac{32\text{ft}}{\text{sec}}$	$\frac{64\text{ft}}{\text{sec}}$	$\frac{96\text{ft}}{\text{sec}}$	$\frac{128\text{ft}}{\text{sec}}$	$\frac{160\text{ft}}{\text{sec}}$	$\frac{192\text{ft}}{\text{sec}}$	$\frac{224\text{ft}}{\text{sec}}$	$\frac{256\text{ft}}{\text{sec}}$	$\frac{288\text{ft}}{\text{sec}}$	$\frac{320\text{ft}}{\text{sec}}$

The same data collection for metric:

$$\text{Table}[(9.8\frac{m}{\text{sec}^2})(t(\text{sec})),\{t,1,10,1\}]$$

$$\{\frac{9.8m}{\text{sec}},\frac{19.6m}{\text{sec}},\frac{29.4}{\text{sec}},\frac{39.2m}{\text{sec}},\frac{49.\,m}{\text{sec}},\frac{58.8m}{\text{sec}},\frac{68.6m}{\text{sec}},\frac{78.4m}{\text{sec}},\frac{88.2m}{\text{sec}},\frac{98.\,m}{\text{sec}}\}\xrightarrow{yields}$$

1sec	2	3	4	5sec
$\frac{9.8m}{\text{sec}}$	$\frac{19.6m}{\text{sec}}$	$\frac{29.4m}{\text{sec}}$	$\frac{39.2m}{\text{sec}}$	$\frac{49.\,m}{\text{sec}}$
6sec	7	8	9	10sec
$\frac{58.8m}{\text{sec}}$	$\frac{68.6m}{\text{sec}}$	$\frac{78.4m}{\text{sec}}$	$\frac{88.2m}{\text{sec}}$	$\frac{98.\,m}{\text{sec}}$

On using ASI curvature ratios, (definitive and principal system curves) to find impact velocity and time of free fall resulting from a specific position potential energy with respect to field center.

PROBLEM: find length of time and velocity of free fall at Earth, 400 feet above the surface.

1. the definitive **ASI** displaced position curvature with respect to center is presented as 1/400
2. The acceleration curvature of central **ASI** point mass **F** is 1/16 as field resultant of unit space-time square diagram of our earth.
3. Establish a direct proportion of (principal curvature) = (definitive curvature) × t^2, and solve for t.

$$\text{Solve}[\frac{1}{16} == \frac{1}{400} * t^2, t]$$

$$\{\{t \to -5\}, \{t \to 5\}\}$$

We see time of free fall is five seconds.
To find impact velocity, double the radius of *position* curvature of the definitive **ASI** and divide by unit time:

$$\frac{400 * 2}{5} = 160$$

We see from our tables that free fall from a height of 400 feet will take 5 seconds to reach the surface and impact velocity at the surface will be 160 feet per second.

Metric assessment; Find impact velocity and time of free fall for an object positioned (240.1 meters) from the surface of the earth:

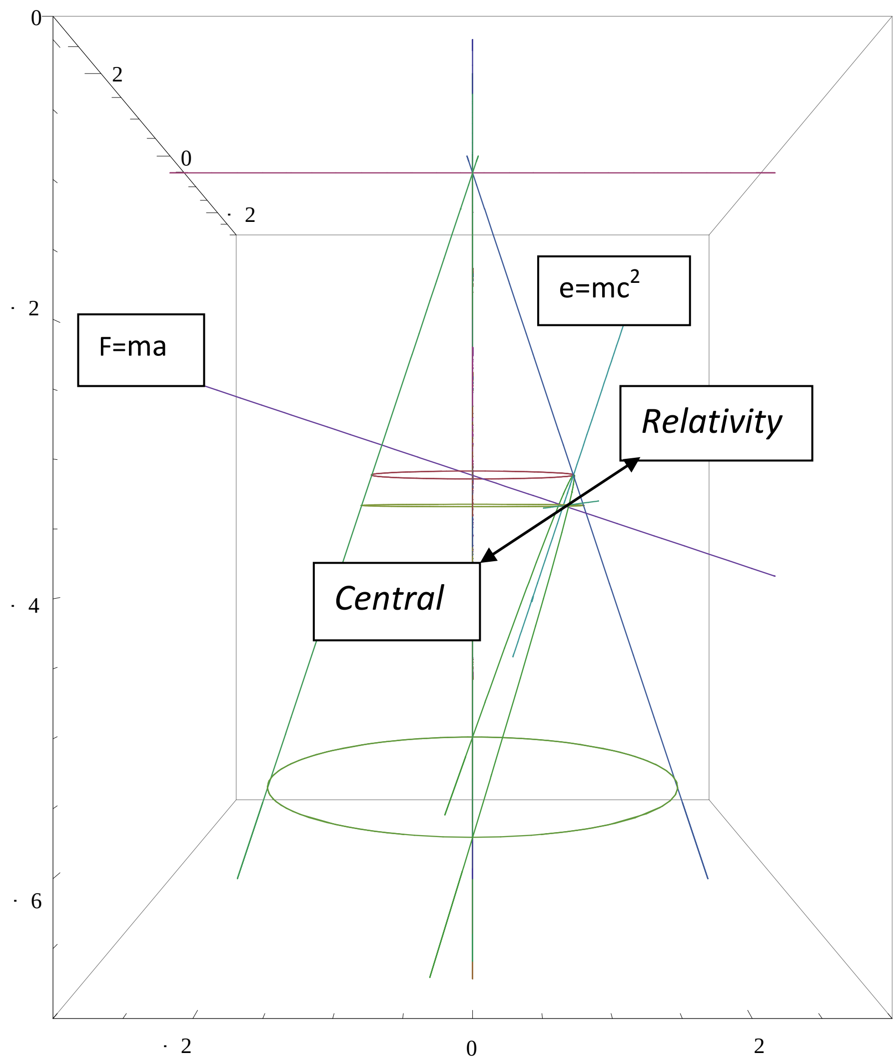
$$\text{Solve}\left[\frac{1}{4.9} == \frac{1}{240.1} * t^2, t\right] \xrightarrow{yields} 7.0$$

Seven seconds of free fall, and impact velocity:

$$\frac{(240.1) * 2}{7} \xrightarrow{yields} 68.6$$

68.6 meters per second.

END CONSTANT ACCELERATION TREATISE. ALEXANDER



COPYRIGHT ORIGINAL GEOMETRY BY

Sand Box Geometry LLC, a company dedicated to utility of Ancient Greek Geometry in pursuing discovery and exploration of natural space curves constructing our 21st century being.

alexander@sandboxgeometry.com