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Physics, Mechanics, Mathematics

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IN THE NAME OF GOD

Investigation has been made into 3 issues each studied separately under the following titles:

Topics

1- **Stable Dynamics (5th dimension)**
2- **Dynamics Trigonometry**
3- **Angular Speed**

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Now regarding what preceded the proof of non-Euclidean trigonometric circle is dealt with and then, non-Euclidean trigonometric proved formula will be compared with Euclidean trigonometric circle.
In Euclidean trigonometric circle , we have :

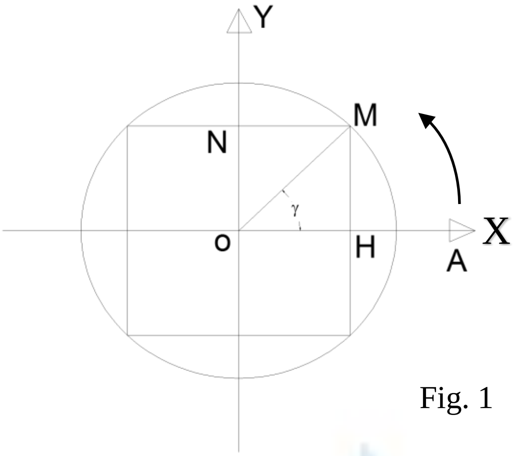

Fig. 1

$$\begin{cases} \overline{OM} = 1 \\ \overline{OH} = \mathrm{Cos}\,\gamma \\ \overline{ON} = \mathrm{Sin}\,\gamma \end{cases}$$

$$(\overline{OH})^2 + (\overline{ON})^2 = (\overline{OM})^2$$

$$\mathrm{Cos}^2\gamma + \mathrm{Sin}^2\gamma = 1$$

Non-Euclidean trigonometric circle is the same as the above Euclidean trigonometric circle (Fig.1) , the difference being that in the above trigonometric circle , the movement of the moving object round axes oy, ox and on the 4 quarters of the trigonometric circle region is studied , so that the movement of the moving object is in the direction of trigonometric movement , that is :

$$\left.\begin{matrix} \overline{OM} = 1 \\ \overline{OH} = (-Vx) \\ \overline{ON} = (Vy) \end{matrix}\right\} \Rightarrow \overline{OH} + \overline{ON} = \overline{OM} \Rightarrow \begin{cases} (-Vx)^2 + (Vy)^2 = 1 \\ Vx^2 + Vy^2 = 1 \end{cases}$$

If $1 \le Vy$ and $1 \le Vx$, the following relation can be used: C_1=cte,($C^2_1.V^2x+C^2_1.V^2y=C^2_1$)
In Euclidean trigonometric circle , the location of each point M is specified on the trigonometric circle.
Euclidean trigonometry can thus be named local trigonometry.
In non-Euclidean trigonometric circle , since the movement of the moving object is studied , and at any moment in time , the moving object has a specific location , non-Euclidian trigonometry can be termed temporal trigonometry.
These 2 local and temporal trigonometric circles are now compared with each other.
In the comparison , it can be concluded that in local trigonometry , only the local situation is followed .
In temporal trigonometry however , both local and temporal situations are followed , and for test and control in 3 planes for local trigonometry, ($\tan\alpha = \tan\beta\,.\tan\gamma$) can be used , and in any type of movement , if temporal trigonometry is applied there will be no need for local trigonometry application . Problems 1 , 2 , … are only practices . If there are applied problems .
Please refer to periodical JOURNAL OF ADVANCES IN MATHEMATICS Vol 10 No 5 date 28 April 2015 , page 3462

First quarter		Second quarter		Third quarter		Fourth quarter	
Cos γ	Vx	Cos γ	Vx	Cos γ	Vx	Cos γ	Vx
+	-	-	-	-	+	+	+
Sin γ	Vy	Sin γ	Vy	Sin γ	Vy	Sin γ	Vy
+	+	+	-	-	-	-	+
tan γ	$Vy/_{Vx}$	tan γ	$Vy/_{Vx}$	tan γ	$Vy/_{Vx}$	tan γ	$Vy/_{Vx}$
+	-	-	+	+	-	-	+
Cotan γ	$Vx/_{Vy}$	Cotan γ	$Vx/_{Vy}$	Cotan γ	$Vx/_{Vy}$	Cotan γ	$Vx/_{Vy}$
+	-	-	+	+	-	-	+

No given relations $z'=\frac{Vz}{Vx}$ and $y'=\frac{Vy}{Vx}$ In planes ozy and oxy , the following relations in 3 planes of oxy , oyz and oxz can be written as follows :

1) $z' = \frac{Vz}{Vx}$ = tan ∝ (In plane oxz)

2) $y' = \frac{Vy}{Vx}$ tan γ (In plane oxy)

By dividing relation (1) by relation (2) , relation (3) can be obtained in plane oyz :

3) $\frac{z'}{y'} = \frac{\frac{Vz}{Vx}}{\frac{Vy}{Vx}} = \frac{\tan\propto}{\tan\gamma} = \frac{Vz}{Vy} = \tan\beta \Rightarrow \frac{Vz}{Vy} = \tan\beta$

No , given relations 1 , 2 & 3 , relation 4 is obtained :

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1) $\frac{Vz}{Vx} = \tan\ \propto$

2) $\frac{Vy}{Vx} = \tan \text{γ}$ $\qquad \frac{Vz}{Vx} = \frac{Vz}{Vy} * \frac{Vy}{Vx}$ ⇨ $4)\ \tan\ \propto = \tan\beta * \tan \text{γ}$

3) $\frac{Vz}{Vy} = \tan\beta$

Relation (4) can be reckoned the basis for the original formula (dynamic trigonometry) . The following formulas will thus be the subset of formula (4) .
As an example :

$\text{Cos} \propto = \frac{1}{\sqrt{1+\tan^2\propto}}$ ⇨ $5)\ \text{Cos}\ \propto = \frac{1}{\sqrt{1+\tan^2\beta\,.\tan^2\text{γ}}}$

$\text{Sin} \propto = \frac{\tan\propto}{\sqrt{1+\tan^2\propto}} = \frac{\tan\beta\,.\tan\text{γ}}{\sqrt{1+\tan^2\propto.\tan^2\text{γ}}}$ ⇨ $6)\text{Sin}\ \propto = \frac{\tan\beta\,.\tan\text{γ}}{\sqrt{1+\tan^2\beta\,.\tan^2\text{γ}}}$

$\text{Sin}\ 2\propto = 2\ \text{Sin} \propto .\ \text{Cos} \propto = 2\frac{\tan\beta.\ \tan\text{γ}}{\sqrt{1+\tan^2\beta.\tan^2\text{γ}}} . \frac{1}{\sqrt{1+\tan^2\beta.\tan^2\text{γ}}} = \frac{2\ \tan\beta\ .\tan\text{γ}}{1+\tan^2\beta\ .\tan^2\text{γ}}$

7) $\text{Sin}\ 2\propto = \frac{2\ \tan\beta\ .\tan\text{γ}}{1+\tan^2\beta\ .\tan^2\text{γ}}$

$\text{Cos}\ 2\propto = \text{Cos}^2 \propto\ - \text{Sin}^2 \propto = \frac{1}{1+\tan^2\beta\ .\tan^2\text{γ}} - \frac{\tan^2\beta\ .\tan^2\text{γ}}{1+\tan^2\beta\ .\tan^2\text{γ}}$

8) $\text{Cos}\ 2\propto = \frac{1-\tan^2\beta\ .\tan^2\text{γ}}{1+\tan^2\beta\ .\tan^2\text{γ}}$

$\text{Tan}\ 2\propto = \frac{\sin 2\propto}{\cos 2\propto} = \frac{2\tan\beta\ .\tan\text{γ} / 1+\tan^2\beta\ .\tan^2\text{γ}}{1-\tan^2\beta\ .\tan^2\text{γ} / 1+\tan^2\beta\ .\tan^2\text{γ}} = \frac{2.\tan\beta\ .\tan\text{γ}}{1-\tan^2\beta\ .\tan^2\text{γ}}$

9) $\text{Tan}\ 2\propto = \frac{2\ \tan\beta\ .\tan\text{γ}}{1-\tan^2\beta\ .\tan^2\text{γ}}$

Practice No 1.
Relation (4) is tan ∝ = tan β . tan ɣ   Given

$$\frac{\sin\ \propto}{\cos\ \propto} = \frac{\sin\beta\,.\sin\text{γ}}{\cos\beta\,.\cos\text{γ}} \Rightarrow \begin{cases}\sin\ \propto = \sin\beta\,.\sin\text{γ}\\ \cos\ \propto = \cos\beta\,.\cos\text{γ}\end{cases}$$

, obtain the relation between tan β , tan ɣ , and in the end , obtain the relations between Vx , Vy and Vz.

$$\left.\begin{matrix}\sin^2 \propto = \sin^2\beta\,.\sin^2\text{γ}\\ \cos^2 \propto = \cos^2\beta\cos^2\text{γ}\end{matrix}\right\} \Rightarrow \sin^2 \propto + \cos^2 \propto = 1 = \sin^2\beta\,.\sin^2\text{γ} + \cos^2\beta.\cos^2\text{γ}$$

$\cos\beta = \frac{1}{\sqrt{1+\tan^2\beta}}$ $\qquad \cos\text{γ} = \frac{1}{\sqrt{1+\tan^2\text{γ}}}$

$\sin\beta = \frac{\tan\beta}{\sqrt{1+\tan^2\beta}}$ $\qquad \sin\text{γ} = \frac{\tan\text{γ}}{\sqrt{1+\tan^2\text{γ}}}$

$1 = \sin^2\beta\,.\sin^2\text{γ} + \cos^2\beta.\cos^2\text{γ}$

If we substitute values $\sin\beta$, $\cos\beta$, $\sin\text{γ}$, $\cos\text{γ}$ in terms of tan γ and tan β in the above relation we will have :

$$\frac{1}{1} = \frac{\tan^2\beta}{(1+\tan^2\beta)} . \frac{\tan^2\text{γ}}{(1+\tan^2\text{γ})} + \frac{1}{(1+\tan^2\beta).(1+\tan^2\text{γ})} \Rightarrow (1+\tan^2\beta.\tan^2\text{γ}) = (1+\tan^2\beta).(1+\tan^2\text{γ})$$

$$1+\tan^2\text{γ} + \tan^2\beta + \tan^2\beta * \tan^2\text{γ} = 1+\tan^2\beta.\tan^2\text{γ}$$

$$\tan^2\text{γ} + \tan^2\beta = 0 \Rightarrow \frac{V^2{}_y}{V^2{}_x} + \frac{V^2{}_z}{V^2 y} = 0$$

Practice No 2.
Given tan α = tan β . tan γ⇨tan γ = $\frac{\tan\propto}{\tan\beta}$, calculate the relations between V_x , V_y & V_z

$$\left.\begin{matrix}\tan\propto = \frac{Vz}{Vx}\\ \tan\beta = \frac{Vz}{Vy}\\ \tan\text{γ} = \frac{Vy}{Vx}\end{matrix}\right\} \Rightarrow \tan\text{γ} = \frac{\tan\propto}{\tan\beta} \Rightarrow \frac{\sin\text{γ}}{\cos\text{γ}} = \frac{\sin\propto/\cos\propto}{\sin\beta/\cos\beta} = \frac{\sin\propto .\ \cos\beta}{\cos\propto .\ \sin\beta}$$

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$$\begin{cases} \sin \gamma = \sin \alpha \,.\, \cos \beta \Rightarrow \sin^2 \gamma = \sin^2\alpha . \cos^2\beta \\ \cos \gamma = \cos \alpha \,.\, \sin \beta \Rightarrow \cos^2 \gamma = \cos^2\alpha . \sin^2\beta \end{cases}$$

$\sin^2 \gamma + \cos^2 \gamma = 1 \Rightarrow \sin^2 \gamma + \cos^2 \gamma = \sin^2 \alpha \,.\, \cos^2 \beta + \cos^2 \alpha \,.\, \sin^2 \beta = 1$

$\sin \alpha = \frac{\tan \propto}{\sqrt{1+\tan^2\propto}} = \frac{Vz/_{Vx}}{\sqrt{1+(\frac{Vz}{Vx})^2}}$, $\sin \beta = \frac{\tan \beta}{\sqrt{1+\tan^2\beta}} = \frac{Vz/_{Vy}}{\sqrt{1+(\frac{Vz}{Vy})^2}}$

$\cos \alpha = \frac{1}{\sqrt{1+\tan^2\propto}} = \frac{1}{\sqrt{1+(\frac{Vz}{Vz})^2}}$, $\cos \beta = \frac{1}{\sqrt{1+\tan^2\beta}} = \frac{1}{\sqrt{1+(\frac{Vz}{Vy})^2}}$

$$\frac{(\frac{Vz}{Vx})^2}{1+(\frac{Vz}{Vx})^2} * \frac{1}{1+(\frac{Vz}{Vy})^2} + \frac{1}{1+(\frac{Vz}{Vx})^2} * \frac{(\frac{Vz}{Vy})^2}{1+(\frac{Vz}{Vy})^2} = \frac{1}{1}$$

$$\frac{(\frac{Vz}{Vx})^2 + (\frac{Vz}{Vy})^2}{[1+(\frac{Vz}{Vx})^2] * [1+(\frac{Vz}{Vy})^2]} = \frac{1}{1} \Rightarrow (\frac{Vz}{Vx})^2 + (\frac{Vz}{Vy})^2 = 1 + (\frac{Vz}{Vy})^2 + (\frac{Vz}{Vx})^2 + (\frac{Vz}{Vx})^2 * (\frac{Vz}{Vy})^2$$

$$1 + \frac{Vz^2}{Vx^2} * \frac{Vz^2}{Vy^2} = 0 \Rightarrow Vz4 = -Vx^2 . Vy^2$$