$$\varepsilon_3 = 4\varepsilon_2 - 2\theta_1 - \varepsilon_1.$$

(By putting

Proof: ~~We put~~ $\alpha^2 = y_i y^i$, $b^i = a^{ij} b_j$, $\beta = b_i y^i$, $\beta^* = b^i p_i$, $p^i = a^{ij} p_j$, $\alpha^{*2} = p_i p^i = a^{ij} p_i p_j$, We have $F = \frac{\alpha^2}{\alpha - \beta}$, and use

$$p_i = \frac{1}{2}\dot{\partial}_i F^2 = \frac{y_i}{\alpha - \beta} + \frac{\alpha^2 b^i - y_i \beta}{(\alpha - \beta)^2}. \tag{22}$$

Contracting in (22) by p^i and b^i we get:

$$\alpha^{*2} = \frac{F}{(\alpha - \beta)^2}[F^2(\alpha - 2\beta) + \alpha^2 \beta^*] \tag{23}$$
$$\beta^* = \frac{F}{(\alpha - \beta)^2}[\beta(\alpha - 2\beta) + \alpha^2 b^2].$$

one constructs

In [10], for a Finsler (α, β)-metric F on a manifold M, ~~there is~~ a positive function $\phi = \phi(s)$ on $(-b_0; b_0)$ with $\phi(0) = 1$ and $F = \alpha\phi(s)$, $s = \frac{\beta}{\alpha}$, where $\alpha = \sqrt{a_{ij} y^i y^j}$ and $\beta = b_i y^i$ with $\|\beta\|_x < b_0$, $\forall x \in M$.

derivatele nu aratǎ la fel! folosiți '' de 2 ori

The function ϕ satisfies $\phi(s) - s\phi'(s) + (b^2 - s^2)\phi''(s) > 0$, $(|s| \leq b_0)$.

A Matsumoto metric is a special (α, β)-metric with $\phi = \frac{1}{1-s}$.

Using Shen's [11] notation $s = \frac{\beta}{\alpha}$ the formula (23) become:

$$\alpha^{*2} = F^2 \frac{1 - 2s}{(1 - s)^3} + F\frac{1}{(1 - s)^2}\beta^* \tag{24}$$
$$\beta^* = Fs\frac{1 - 2s}{(1 - s)^2} + F\frac{1}{(1 - s)^2}b^2.$$

Now we put $1 - s = t$, ~~so~~ i.e. $s = 1 - t$ and both equations become:

$$\alpha^{*2} = F^2 \frac{2t - 1}{t^3} + F\frac{1}{t^2}\beta^* \tag{25}$$

$$\beta^* = F(1 - t)\frac{2t - 1}{t^2} + F\frac{1}{t^2}b^2. \tag{26}$$

We get

$$\beta^* t^2 = M(-2t^2 + 3t + b^2 - 1) \tag{27}$$

. ←

obtain

For $b^2 = 1$ from (26) we ~~get~~ obtain

$$F = -\frac{\beta^* t}{2t - 3} \tag{28}$$

and ~~substitute~~ by substitution of F in (25), after ~~computation~~ some computations we ~~have~~ get a cubic equatio n: ← o

$$t^3 - 3t + \frac{9}{4}t - \frac{\beta^*}{2\alpha^{*2}} = 0. \tag{29}$$