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An Evolutionary Structure of Convex Quadrilaterals. Part II

[For Part I see the authors, J. Convex Analysis 15 (2008) 411-426.]

 We solve explicitly the generalized Gauss problem for convex quadrilaterals in the two dimensional Euclidean Space. By introducing the variable

$$c = c_G + \frac{|B_1 - B_4| + |B_2 - B_3|}{2}, \quad \text{where} \quad c_G = \frac{1}{2}$$

is the Gauss constant and B_i are positive real variables, such that $\sum_{i=1}^{4} B_i = 1$, we derive some new evolutionary structures of convex quadrilaterals and we give the definition of the degree of plasticity of convex quadrilaterals which could be extended to the degree of plasticity of convex polygons with respect to the topology of weighted Steiner minimal trees. Finally, the solution of the weighted Steiner tree problem for convex quadrilaterals gives a second property, which is the translation between the two Fermat-Torricelli points.