

1079-32-303

Matvei Libine* (mllibine@indiana.edu). *The quaternionic cross-ratio and its properties.*

I will talk about a quaternionic analogue of the cross-ratio and its properties. For example, the quaternionic cross-ratio can be used to give a simple criterion for the existence of a quaternionic fractional linear transformation mapping one quadruple of points into another or one quintuple of points into another. The quaternionic cross-ratio can also be used to tell if given four points lie on a single circle (or a straight line) or if given five points lie on a single 2-sphere or (or a 2-plane).

As an application of the quaternionic cross-ratio we will show that the fractional linear transformations on the space of quaternions map spheres (or affine subspaces) of dimension 1, 2 and 3 into spheres (or affine subspaces) of the same dimension.

This is a joint work with an undergraduate student Ewain Gwynne. (Received January 17, 2012)