Deriving Range Circle Center and Radius from Domain Circle Center and Radius Under the Linear Fractional Transformation (LFT):

\[ w = \frac{az + b}{cz + d} \]

Preliminary report.

It is well known that Linear Fractional Transformations (LFT’s):

\[ w = \frac{az + b}{cz + d}, \]

where \( z, w, a, b, c, \) and \( d \) are all in the Complex Plane, map the set of lines and circles into itself. Then for a Domain Circle, \( |z - C| = R \), not passing through the pole \( \left( \frac{-d}{c} \right) \) of the LFT, which maps to a Range Circle \( |w - C^*| = R^* \), we derive explicit formulas for the range circle’s \( C^* \) and \( R^* \) in terms of \( C \) and \( R \) from the domain circle and the coefficients \( a, b, c, \) and \( d \) of the LFT. (Received July 01, 2014)