

1102-30-36

**Walter M. Reid\*** ([reidwm@uwec.edu](mailto:reidwm@uwec.edu)), 105 Garfield Avenue, Eau Claire, WI 54702-4004.

*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,  $|z - \mathbf{C}| = \mathbf{R}$ , not passing through the pole ( $-\frac{d}{c}$ ) of the LFT, which maps to a Range Circle  $|w - \mathbf{C}^*| = \mathbf{R}^*$ , we derive explicit formulas for the range circle's  $\mathbf{C}^*$  and  $\mathbf{R}^*$  in terms of  $\mathbf{C}$  and  $\mathbf{R}$  from the domain circle and the coefficients  $a, b, c,$  and  $d$  of the LFT. (Received July 01, 2014)