## Curvature (k) calculations

- Multi-step calculations Done in R code 'Kinematics.R'

$$A = \left[ \sum_{i=(x,y)} \left( C_{i2} - C_{i1} \right)^2 \right]^{0.5}$$ This is the length of segment A (point 1-point2)

$$B = \left[ \sum_{i=(x,y)} \left( C_{i3} - C_{i2} \right)^2 \right]^{0.5}$$ This is the length of segment B (point 2-point 3)

$$C = \left[ \sum_{i=(x,y)} \left( C_{i3} - C_{i1} \right)^2 \right]^{0.5}$$ This is the length of segment C (point 1-point 3)

$$s = \frac{A + B + C}{2}$$

$$R = \frac{A * B * C}{4 * \left[ s * (s - A) * (s - B) * (s - C) \right]^{0.5}}$$

$$Curvature = 1 / R$$