

## Problem of the week #8

Due October 25th

Suppose two balls are rotating against each other without slipping. The line segment joining their centers makes acute angles  $\theta_1$  and  $\theta_2$  with their axes of rotation. Their angular velocities are  $\omega_1$  and  $\omega_2$ .

(Angular velocities could be in e.g. revolutions or radians per time; units won't matter. Do not assume the balls have equal radii.)

**Problem.** Show the axes of rotation intersect at a point, and moreover if that point lies in the unique plane separating the two balls then

$$\omega_1 \cos \theta_1 = \omega_2 \cos \theta_2.$$

- Partial credit may be given for partial answers.
- Each POW will be due the following week at 1pm.
- Questions? Email: [bthorner@unomaha.edu](mailto:bthorner@unomaha.edu)
- Submit solutions to (above email), DSC 210, or DSC 203.
- POWs, solutions, backgrounds, leaderboard available at

[https://www.unomaha.edu/college-of-arts-and-sciences/mathematics/student-opportunities/pow\\_solutions.php](https://www.unomaha.edu/college-of-arts-and-sciences/mathematics/student-opportunities/pow_solutions.php)