Assignment #2: Angular Kinematics

Description

During the course section on angular kinematics, the students are given multiple mathematical-based questions concerning angular velocity, angular to linear velocity conversions, as well as radial and tangential accelerations. Examples of the questions are provided below. Students are instructed to solve the questions on their own, showing all their computational work.

Example Question

Example of angular kinematics questions:

1. A softball pitcher is rotating her arm at 360 degrees/sec. What is her angular velocity in rad/s?
2. David is fighting Goliath. If David's 0.75-m sling is accelerated for 1.5 s at 20 rad/s2, what will be the initial velocity of the projected stone?
3. A golfer swings a 1.2-m golf club with an arm length of 0.76 m. If the initial velocity of the golf ball is 35 m/s, what was the angular velocity of the club at the point of ball contact?
4. A polo player's arm and stick form a straight radius of 2.5m. If they swing at an angular speed of 1.0 rad/s as the player's horse gallops at 5 m/s, what is the resultant velocity of a motionless ball that is struck on the ground? (Assume that ball velocity is the same as the linear velocity of the end of the stick.)

Ancillary AI Assessment (AAA)

The students will copy and paste each question in ChatGPT and request the AI to suggest a workflow on how to solve the problem. The students will instruct ChatGPT to only provide a workflow without the solution. The students will submit the completed chat file/link along with a written discussion on the following questions.

- Did ChatGPT provide an accurate workflow on how to solve each problem?
- Was each of the suggested workflows similar to the methods outlined in class? If not, how did they differ? Did the software use a formula or concept that we have not covered?
- Rework each problem using the suggested workflow from ChatGPT. Are the final solutions the same as the ones you originally found?
- Compare using ChatGPT in this manner to a human tutor. What are their similarities and differences?
- Using the ethical framework outlined in the Montreal Declaration, does using ChatGPT to provide a workflow on how to solve the question without providing a solution constitute ethical and responsible usage?