Assignment #1: Linear Kinematics

Description

During the course section on linear kinematics, the students are given multiple mathematical-based questions concerning distance, displacement, speed, and velocity. Examples of the questions are provided below. First, students are instructed to solve the questions on their own, showing all their computational work.

Example Questions

Example of linear kinematics questions:

1. A tennis ball leaves a racket during the execution of a perfectly horizontal ground stroke with a speed of 27 m/s. If the ball is in the air for 0.8 seconds, what horizontal distance does it travel?
2. A soccer ball is rolling down a field with an initial velocity of 4 m/s. If the acceleration of the ball is constant at −0.3 m/s2, how long will it take the ball to come to a complete stop?
3. A ball is dropped from an unknown height. It takes 7.53sec to travel before it hits the ground. Ignoring air resistance, what is the final velocity of the ball immediately before hitting the ground?
4. A student is running around a circular track at a constant speed. The track has a circumference of 400 meters. She starts and stops running at the same point on the track after completing three full laps. What was her total distance traveled?
5. A student is running around a circular track at a constant speed. The track has a circumference of 400 meters. She starts and stops running at the same point on the track after completing three full laps. What was her total displacement?

Ancillary AI Assessment (AAA)

The students are then instructed to copy and paste each question in ChatGPT and request the program to create practice problems that solve for similar variables using their own verbiage. The students will instruct ChatGPT to only provide the question without the answer. The students will submit the completed chat file/link along with a written discussion on the following questions.

- Did ChatGPT accurately create similar word problems to the ones provided?
- Are you able to solve the problems based on the concepts that we have covered in class?
- Did you violate any course policies in using ChatGPT to help you study in this manner?
- Using the ethical framework outlined in the Montreal Declaration, does using ChatGPT to create these practice questions constitute ethical and responsible usage?

This material was developed by Dr. Michael Jarrett as a part of Winston-Salem State University's Center for Applied Data Science (CADS) Faculty Adopter Program 2023-2024