

## Assignment #3: Linear Kinetics

### Description

During the course section on linear kinetics, the students are given multiple mathematical-based questions concerning linear momentum, force, kinetic and potential energy. 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 linear kinetics questions:

1. Lineman A has a mass of 100 kg and travels with a velocity of 4 m/s when he collides head-on with Lineman B, who has a mass of 90 kg and is traveling at 4.5 m/s. If both players remain on their feet, in which direction will the combined mass of the two bodies go and how fast?
2. Two skaters gliding on ice ran into each other head-on. If the two skaters hold onto each other and continue to move as a unit after the collision, what will be their resultant velocity? Skater A has a velocity of 5 m/s and a mass of 65 kg. Skater B has a velocity of 6 m/s and a mass of 60 kg.
3. An 850-N man ascends a set of 25 stairs, each of 20 cm height in 11.5 seconds. Calculate the mechanical work, power, and change in potential energy from the bottom of the stairs to the top.
4. Using the principle of conservation of mechanical energy, calculate the maximum height achieved by a 7-N ball tossed vertically (straight up) upward with an initial velocity of 10 m/s.

### Tags

### Assigned Readings

### Ancillary AI Assessment (AAA)

The students will copy and paste each question and their answers in ChatGPT and request the AI to check their answers for accuracy. The students will submit the completed chat file/link along with a written discussion on the following questions.

- Did ChatGPT find your answers to be correct? If not, did it offer a workflow to correct the problem?
- Which solution (yours or the one provided by ChatGPT) do you believe to be the actual correct answer? Why?
- Did you change one of your answers based on the output from ChatGPT? Why?
- Did you violate any course policies by using ChatGPT in this manner?
- Compare using ChatGPT in this manner to working with a human tutor or your profession during office hours. What are their similarities and differences?
- Using the ethical framework outlined in the Montreal Declaration, does using ChatGPT to check your solutions to math problems constitute ethical and responsible usage?