

EDUH 1017 - Sports Mechanics
Progressive Test - SAMPLE
Time allowed : 40 minutes
Closed book - Formula Sheets are provided

Family Name	First Name
S.I.D.	Lab Session

Question 1

- (a) In walking, what force propels you forward? How does it arise?
(b) Does it generally take more force to start walking or to continue walking? Why?
(c) Sketch yourself walking at the instant when you have your front foot in the air - before it lands on the ground. Add to the diagram all the forces *acting on you* at that instant.
(5 marks)

Question 2

A free-falling sky diver jumps out of a plane at an altitude of 3000 m and free-falls to 500 m above the ground, when he opens his parachute.
Sketch a *distance versus time* graph of his fall, assuming air resistance on his body is negligible (although not on the parachute!). Include any numbers you think are relevant.
(5 marks)

Question 3

- (a) The *longest* passenger liner ever built was the *France* at 315.5 m and around 66,000 tonnes (6.6×10^7 kg). Suppose its bow passes the end of a pier at 2.5 m/s while the ship is accelerating uniformly at 0.01 m/s^2 .
(i) At what speed will the stern of the vessel pass the end of the pier?
(ii) What force is being exerted to achieve this acceleration?
(iii) How much work is done to achieve this change in speed?
- (b) The largest modern supertanker is much larger - 458.4 m long and over 500,000 tonnes! Fully loaded it moves at 30 km/h (16 knots). It can take 20 minutes to bring a ship this size to a stop!
(i) Calculate the deceleration in m/s^2 .
(ii) Calculate the stopping distance.
(10 marks)

**The solutions to this Test can be found on the unit WebCT site
under the *Sample Exam. Paper link***

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