

Motion and Force in a Gravitational Field

Revision Problems 1: Vectors

Due: _____

Name: _____

(20 marks)

1. Sam is out walking for exercise. He walks 2.50 km South then 3.30 km East.
 - a. Calculate his displacement. (3 marks)

 - b. If the walk took 30.0 minutes, calculate his velocity. (2 mark)

2. Jennifer is running laps around the 4.00×10^2 m circular track. She finds on average that it takes her 1.12 minutes to do a lap. Work out Jennifer's velocity when she is one quarter of the way around the track. (4 marks)

3. Ashley throws a 0.200 kg tennis ball against the wall of a house watched by Toby. The ball hits the wall at 5.00 ms^{-1} East and rebounds with a velocity of 3.50 ms^{-1} West. Toby determines that the change in velocity took 2.00×10^{-2} s. Calculate the force of the wall on the ball. (3 marks)

4. Lukah is driving her new car at 54.0 kmh^{-1} West when she rounds a corner to be travelling at 39.6 kmh^{-1} North. If the change in velocity took 2.80 s , what was the car's acceleration around the corner? (4 marks)
5. Kristian is flying a model airplane attached to a string. The string is at an angle of 35.0° to the horizontal and has a tension of 69.0 N . Determine the horizontal and vertical components of the tension. (2 marks)
6. A boy on a bike is free-wheeling down a hill which has a slope of 35.0° . The mass of the boy and his bike is 90.0 kg . Assuming no friction, calculate the force accelerating him down the hill. (2 marks)