

Motion Equation Questions 3: Velocity

1. For the last time, consider the situation in which Jörg rolls a large steel ball along a flat floor at 1.5 ms^{-1} while Nirk jumps upwards at 9 ms^{-1} .
 - (a) State the steel ball's speed after 3.8 seconds. Give a reason for your answer. /2
 - (b) Calculate Nirk's velocity as he lands. /3

2. A lemming sprints off the edge of a cliff, travelling 3.0 ms^{-1} horizontally.
 - (a) Calculate the lemming's vertical velocity 2.5 seconds later. /3
 - (b) State the lemming's horizontal velocity at this time. /2
 - (c) Use vector addition to determine the lemming's total velocity at this time. /3

3. Consider the boulder in Assignment 2, launched from a catapult, and landing at the same height it was launched.
The horizontal component of initial velocity was 24 ms^{-1} to the right and the vertical component of initial velocity was 21 ms^{-1} upwards.
 - (a) Calculate the velocity of the boulder just as it lands. /4
 - (b) State the velocity of the boulder at maximum height. /2

TOTAL /19

