NAME_____

Motion Equation Questions

1. Jörg Ngunderssón rolls a large steel ball along a flat wooden floor. When he releases the ball it is travelling at 1.5 ms^{-1}.
   (a) Calculate the displacement of the ball after 3.8 seconds. /2
   (b) Determine the velocity of the ball after 3.8 seconds. /2
   (c) Calculate the time it takes the ball to travel 11 m. /2

2. Further along the floor is Jörg's fiercest foe, Nirk Tergbrüm. The ball rolls slowly towards him and he jumps over it. His initial vertical speed is 9 ms^{-1}.
   (a) Calculate the maximum height reached by Nirk. /2
   (b) Calculate Nirk's time of flight. /2
   (c) Determine Nirk's velocity just as he hits the ground. /3

3. 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
   (d) The cliff is 100m from the crashing waves of the ocean below.
   Calculate how long it will take the lemming to reach the crashing waves. /2
   (e) Calculate how far the lemming has travelled horizontally when it plunges into the sea. /2

TOTAL /25