



This worksheet is based on events in the mathematical thriller A Question of Will. Get it now at:

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Escape the Nuke

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The Scenario

Will is stuck at the top of Mt Cootha with only minutes left until the nuke he's left deep under the mountain explodes, taking him and everything else with it. His only chance is to escape the zone of destruction – but he's got very limited options! He's just made it onto the top of the mountain and there's only six minutes (by the time he makes it to the shed) until the nuke goes off. He has a couple of possible options for escape – a bike, a wingsuit – and no time to make a considered decision.

Question 1 (4 marks)

Will's first option is to run up 500 metres of stairs carrying a bike, then ride downhill along the road as fast as he can. If he can run up the stairs at an average speed of 10 km/hr, and ride downhill at an average speed of 50 km / hr, how far away will he make it in six minutes?

Question 2 (2 marks)

Will's other option is to climb the television tower and jump off the top in a wingsuit. If he jumps with 100 seconds left until the bomb goes off and his wingsuit has an average horizontal speed of 120 km/hr, how far away will he get before the bomb goes off?

Question 3 (2 marks)

After ten to fifteen seconds of falling, the wingsuit reaches a glide ratio of 2.5 to 1 – falling 1 unit for every 2.5 units it moves horizontally. If the horizontal velocity of the wingsuit at this stage is 120 km/hr, what is the vertical falling rate? How much slower is this fall rate than the slowest terminal velocity of a falling human?

Question 4 (3 Marks)

Draw a graph showing time on the x-axis and wingsuit altitude on the y-axis. The wingsuit will initially fall vertically downwards like a stone, before gaining sideways velocity and generating lift and hence slowing its rate of descent.