

Homework Problems

1. Assume the Earth is a sphere with radius 6371 **km** and it rotates on its axis once in exactly 24 hours. What is the speed of a person standing at the equator relative to the centre of the Earth? Give your answer in **m/s**.
2. We have a ladder with 100 steps and a very large number of identical eggs. We want to find the highest step from which an egg can be dropped without breaking. Dropping an egg from a step is considered as one test. What is the minimum number of tests with which you can guarantee to work out the highest safe dropping height?
3. You have a glass full of lemonade. You drink half of it and give it to your friend. You then drink half of what is left and give it back to your friend. You then drink half of what is left, and pass it back. You both keep drinking half of the remaining lemonade then passing it across until there is a negligible amount of drink left. In total, what proportion of the pint did you drink?