

Answer to the question 82297, Math / Discrete Mathematics

Mathematical Induction. Suppose that you know that a cyclist rides the first kilometre in an infinitely long road, and that if this cyclist rides one kilometre, then she continues and rides the next kilometre. Prove that this cyclist will ride every kilometre in that infinite road.

Let us prove this by contradiction. Assume that the cyclist will ride not every kilometer of the road. Then there exists the minimal kilometer which the cyclist will not ride. Denote the kilometer by k . As the kilometer is minimal the previous kilometer $(k - 1)$ the cyclist will reach. But then we obtain contradiction, as by our assumption if the cyclist will reach kilometer $k - 1$ he will reach also kilometer k .