

Homework Problems

1. Every four-digit numerical palindrome (e.g., 2772) is a multiple of 11; what is the reason for this fact?
2. Two runners start from the same point on a circular track and run at different constant speeds. If they run in opposite directions on the track, they meet after a minute. If they run in the same direction, they meet after an hour. What's the ratio of their speeds?
3. Rewrite 1,000,000 as the product of two positive integers, where neither number contains the digit zero.
4. Show that in any group of 29 people, there must be at least 5 individuals who share the same day of the week as their birthday.