True Story  Between Osaka and Kyoto Japan run two kinds of train, the ordinary passenger trains (run by Hankyu, Japan Railways (JR), and others), and the Shinkansen (“bullet train”). One day in 1995, while riding the Hankyu railway to Kyoto, I saw a bullet train go by, in the same direction, overtaking us so rapidly that we might have been stationary, though our train was travelling at its maximum speed. Naturally, I wondered how fast each of us was going, but there the matter sat due to insufficient data.

Months later, on the same line, we were again overtaken by a Shinkansen. This time, I noted that it took about 15 seconds for the Shinkansen to pass us. Watching the scenery go by, I realized that if I another Shinkansen passed us in the opposite direction, I could deduce both of our speeds. Obligingly, this occurred about two minutes later; it took about 4 seconds for the oncoming trains to pass.

Problem 3  A Shinkansen is about 1000 feet long (five cars of 200 feet each). Assuming all trains travel at constant speed between Osaka and Kyoto, how fast does a Shinkansen travel, and how fast is a Hankyu train?