



Problem of the Week

Problem B and Solution

Friendly Towers

Problem

Friendly Towers is a high-rise apartment building. Dieter and three of his friends, Sanjay, Bethany, and Ivanka live on different floors of Friendly Towers. Dieter lives on the 9th floor. Friendly Towers has five times as many floors as Dieter's floor number. Bethany lives on the third floor below the top floor. Ivanka lives two floors above Sanjay, and Sanjay lives 5 floors below Bethany. On the floor which is $\frac{8}{9}$ ths of the way to the top of the building, you will find a pool used by residents of the building. Which floor do each of Sanjay, Bethany, and Ivanka live on, and on which floor is the pool located?

Solution

To begin, we must determine how many floors there are in Friendly Towers. We are given that the number of floors is 5 times Dieter's floor number. Thus, Friendly Towers has $5 \times 9 = 45$ floors.

Bethany lives 3 floors from the top floor. Since $45 - 3 = 42$, she lives on the 42nd floor.

Sanjay lives 5 floors below Bethany. Since $42 - 5 = 37$, he lives on the 37th floor.

Ivanka lives 2 floors above Sanjay. Since $37 + 2 = 39$, she lives on the 39th floor.

The pool is $\frac{8}{9}$ of the way to the top. Since $\frac{8}{9} \times 45 = 40$, it is on the 40th floor.

