



Problem of the Week



Problem C and Solution

Five on the ION

Problem

On Saturday afternoon, Ajay, Badr, Ciro, Dena, and Ema got on the same ION light rail train at University of Waterloo station. Each person was listening to something different on their headphones and each person got off at a different station. Using the clues below, determine which station each person got off at, and what they were listening to.

- (1) Ciro got off the train at Fairway station but was *not* the person who was listening to the news.
- (2) The person who got off at Central station was listening to an audiobook, and was *not* Dena.
- (3) The person who was listening to a hockey game was *not* the person who got off at Borden station.
- (4) Ema was listening to music and got off at Queen station.
- (5) Ajay was listening to a podcast but was *not* the person who got off at Willis Way station.

Solution

We can use a table to summarize the information in the clues. We will start by filling in the information from clues (1), (4), and (5). If we know that something does not go in a particular cell, we will also include that in the table.

| Person | Station | Listening to |
|--------|-----------------------|-----------------|
| Ajay | <i>not</i> Willis Way | podcast |
| Badr | | |
| Ciro | Fairway | <i>not</i> news |
| Dena | | |
| Ema | Queen | music |

From clue (2), we know the person who got off at Central station was listening to an audiobook. The only people who have not been matched with a station or what they were listening to are Badr and Dena. Since clue (2) also tells us this person was not Dena, it follows that Badr got off at Central station and was listening to an audiobook.

Then, since we know someone got off at Willis Way station and it was not Ajay, it follows that it must have been Dena since she's the only remaining person who hasn't been matched with a station.



Similarly, we know someone was listening to the news and it was not Ciro. Thus, it must have been Dena since she's the only remaining person who hasn't been matched with what they were listening to. These updates are shown in the table below.

| Person | Station | Listening to |
|---------------|-----------------------|---------------------|
| Ajay | <i>not</i> Willis Way | podcast |
| Badr | Central | audiobook |
| Ciro | Fairway | <i>not</i> news |
| Dena | Willis Way | news |
| Ema | Queen | music |

Finally, clue (3) tells us someone was listening to a hockey game and someone got off at Borden station. Since Ciro is the only person who hasn't been matched with what they're listening to, Ciro must have been listening to a hockey game. Similarly since Ajay is the only person who hasn't been matched with a station, Ajay must have gotten off at Borden station. Thus, our final solution is shown.

| Person | Station | Listening to |
|---------------|----------------|---------------------|
| Ajay | Borden | podcast |
| Badr | Central | audiobook |
| Ciro | Fairway | hockey game |
| Dena | Willis Way | news |
| Ema | Queen | music |