

Problem 1: Identifying the Digit

"I am thinking of a 5-digit number.

- The digit in the thousands place is **twice** the digit in the ones place.
- The digit in the hundreds place is **half** the digit in the tens place.
- The digit in the ten-thousands place is the **largest possible digit**.
- The digit in the ones place is the **smallest non-zero digit**.

What is my number?

Answer:

- The **ten-thousands place** is the largest possible digit, which is **9**.
- The **ones place** is the smallest non-zero digit, so it's **1**.
- The **thousands place** is twice the digit in the ones place, so it's $2 \times 1 = 2$.
- The **hundreds place** is half the digit in the tens place, so the tens place must be an even number. Let's try **4** for the tens place, meaning the hundreds place is $4 \div 2 = 2$.

The number is **92,241**.

Problem 2: The Value Switch

Take the number **523,841**.

- **Switch the digits** in the hundreds place and the ten-thousands place.
- What is the new number?
- By how much has the value changed?

Answer:

- The **hundreds place** in the original number is **8**, and the **ten-thousands place** is **2**.
- Switch these digits to get the new number: **583,421**.

To find how much the value has changed:

- Original number: **523,841**
- New number: **583,421**
- Change: $583,421 - 523,841 = 59,580$

The value has increased by **59,580**.

Problem 3: Largest and Smallest Numbers

Using the digits **4, 8, 1, 5, 2**, form the **largest** and **smallest** 5-digit numbers possible.

- What is the difference between the two numbers?

Answer:

- **Largest number:** Arrange the digits in descending order: **85421**.
- **Smallest number:** Arrange the digits in ascending order: **12458**.

Difference:

$$85421 - 12458 = 72963$$

The difference between the largest and smallest numbers is **72,963**.

Problem 4: Missing Digit

In the number **4_428**, a digit is missing.

- The value of the entire number is **1,000 more** than **42,428**.
- What is the missing digit?

Answer:

If the number is 1,000 more than **42,428**, the total number must be:

$$42,428 + 1,000 = 43,428$$

Therefore, the missing digit is **3**.
