Number Theory & Cryptography: Kickoff Worksheet

This worksheet is designed to get your brain warmed up and ready to explore Number Theory and its surprising connections to cryptography. Try these short puzzles and challenges before we dive into the lesson.

1. Quick Brain Teasers

1. Clock Math: If it's 9 o'clock now, what time will it be in 100 hours?
2. Divisibility Check: Without using a calculator, is 123456 divisible by 3? By 9?
3. Remainder Riddle: When 23 is divided by 5, what is the quotient and remainder?
4. Think about primes: Why is 2 a very 'special' prime compared to all the others?

2. Connecting to Cryptography

1. Secret Sharing: If you and your friend each pick a prime number and multiply them together, why might it be hard for someone else to figure out your original primes just from the product?
2. Check Digits: Look at the number 12345. Imagine we add a 'check digit' at the end so that the whole number is divisible by 9. What should that digit be?
3. Randomness Matters: Computers use 'pseudorandom' numbers to encrypt messages. Can you come up with your own simple way to make a random-looking number from your birthday?

3. Reflection

Which of these problems felt easy, and which felt tricky? As we continue, we'll see how these simple ideas build the foundation for modern cryptography — the math that keeps secrets safe online.