

Modular Arithmetic (Teacher Version)

Corresponding Material

Basic Math

Discussion

Modular arithmetic is a helpful system that lets us do some math magic. Modular arithmetic is similar to regular division, with one key difference. Instead of taking the whole result of the division, we take the remainder. We use the percent sign % to indicate that we are going to “mod” a number.

How Does It Work?

Here are a few examples:

Even Division: No Remainder

$4 \div 2 = 2$	$4 \% 2 = 0$
Four divides evenly by two. Two goes into four evenly two times. There is no remainder.	Because two goes evenly into four, there is no remainder, and the result is zero.

Uneven Division: Remainder

$5 \div 2 = 2.5$	$5 \% 2 = 1$
Five does not divide evenly by two. There is a remainder.	We get an answer of one. Two goes evenly into five twice (as $2 * 2 = 4$), with a remainder of 1.

Class Exercise

Fill in the results:

1. $3 \% 2 = \mathbf{1}$	2. $2 \% 2 = \mathbf{0}$	3. $21 \% 3 = \mathbf{0}$
4. $10 \% 5 = \mathbf{0}$	5. $7 \% 2 = \mathbf{1}$	6. $7 \% 4 = \mathbf{3}$
7. $20 \% 6 = \mathbf{2}$	8. $10 \% 4 = \mathbf{2}$	9. $65 \% 60 = \mathbf{5}$

Bonus

Can you think of a way to use modular arithmetic to tell if a number is even or odd?

Even numbers are evenly divisible by two. So, if any number mod 2 is 0, the number is even!