



*What sort of game is this?*

In the equations on the next page, replace each letter with a Roman numeral so that the equations are mathematically correct. Every 'word' follows standard Roman numeral rules.

The same values are used for all of the letters across all of the equations — if A represents I (1) in the first equation, then any instance of A in any other equation is also I (1).

In addition, *you can't have 2 letters standing for the same Roman numeral in the same word.* (E.g., in the word MATH, it's not possible for both T and H to correspond to the numeral I (1)).

The letters I (1), V (5), X (10), L (50), C (100), D (500), and M (1000) take their normal Roman numeral values.

**In the diagram at the bottom of the second page, fill in the columns associated with each Roman numeral with the corresponding letters in alphabetical order.**

### How Roman Numerals Work<sup>1</sup>:

1. Numerals are generally written largest to smallest (Ms before Ds, Ds before Cs, etc.)
2. When I, X, C or M are repeated, their sum represents the value (XX = 10 + 10 = 20).
3. A numeral can't appear more than 3 times in a row (e.g., you can't write 40 as XXXX).
4. V, L, and D are never repeated.
5. Placing a numeral *after* one of greater value results in their sum (e.g, VI = 5 + 1 = 6).
6. When an I, X, or C is *before* a numeral of greater value, it's subtracted from the following numeral.
7. When an I, X or C is *between* two numerals of greater value, it's subtracted from the numeral on its right (e.g., XIV = 10 + (5 - 1) = 14).

<sup>1</sup> Adapted from [www.cuemath.com/numbers/roman-numerals](http://www.cuemath.com/numbers/roman-numerals).



**Rules Summary:**

- Each letter is replaced by a single Roman numeral.
- Each letter represents the same Roman numeral across all equations.
- Within each word, each distinct Roman numeral is assigned to a single letter.
- Roman numerals are assigned to themselves, e.g. M = M.

$$\begin{array}{r} \text{M A T H} \\ + \text{P I} \\ \hline \text{M O R E} \end{array}$$

$$\begin{array}{r} \text{J U L I E} \\ + \text{A N T} \\ \hline \text{M U N R O E} \end{array}$$

$$\begin{array}{r} \text{B U L K Y} \\ + \text{C A P E} \\ \hline \text{G U C C I} \end{array}$$

$$\begin{array}{r} \text{J A Z Z} \\ + \text{S U X X I X} \\ \hline \text{M C U R L Y} \end{array}$$

$$\begin{array}{r} \text{S M A S H} \\ + \text{S A L E} \\ \hline \text{G N A W} \end{array}$$

$$\begin{array}{r} \text{B A A T H} \\ + \text{D O R R Y} \\ \hline \text{Q U A C K} \end{array}$$

$$\begin{array}{r} \text{M U F F Y} \\ + \text{A C E} \\ \hline \text{M U S A V I} \end{array}$$

	1	5	10	50	100	500	1000
	I	V	X	L	C	D	M
I			L	C	D		
	V	X					M