Roman Numerals
Study Development Factsheet

Roman numerals are a system for writing numbers down that originated in ancient Rome. Though we now much more commonly use Arabic numerals, Roman numerals can be found in many places. For example, some clock faces, including that of Big Ben in London, are written in Roman numerals. Many numeracy tests will have a question or two about reading Roman numerals. We use Roman numerals to name monarchs and popes. It is worth understanding how to read these across many different disciplines.

Symbols

I	1
V	5
X	10
L	50
C	100
D	500
M	1000
$\overline{\overline{Y}}$	'Y' thousand

Ordering rules

- If two of the same symbol are placed next to each other, this means that we add them.

For example, if we would like to write 3 in Roman numerals, we write III, meaning '1 + 1 + 1'.

- If a symbol has a symbol of lower value written after it, this means we add that value.

For example, VI meaning 5 + 1 = 6

- If a symbol has another symbol of lower value written before it, this means we subtract that value.

For example, the Roman numeral IX means 'X − I', or '10 − 1 = 9'.

- Some numbers may seem like they could be written in multiple ways. For example, 8 could be written as VIII or IIX. The rule is that there can only be one symbol written before another indicating that it should be taken away. Therefore, 3 is written as III not IIV, and 8 is written as VIII not IIX.

For a further example, 89 is written as LXXXIX. As in, 50 + 30 + 9 = L + XXX + IX = LXXXIX.

- A bar written on top of any symbol means we multiply that symbol by 1000.

For example, if we wanted to write 10,500 in Roman numerals, we would write $\overline{X}$D.

Reading a Roman Numeral

1. Read the numeral right to left.
2. Write down the symbol that it the furthest on the right.
3. Move to the symbol that is on the left of the one you have just written. If this symbol is of a higher or equal value to the symbol to its right, we add it to the first symbol.
4. If the symbol to the left is of lower value than the symbol to its right, we take it away.
5. Repeat this process across the entire numeral.
6. Translate the added Roman numerals into Arabic numerals.
7. Perform the calculation.

Examples

Write the Roman numeral CXCV in Arabic numerals.

1. We begin at the right of the numeral.
2. The first symbol is V.
3. The symbol to the left, C, is of higher value than V, so we add them: $V + C$.
4. The symbol to the left of C, X, is of lower value than C, so we take it away: $V + C - X$.
5. The symbol to the left of X, C, is of higher value than X, so we add it: $V + C - X + C$.
6. We convert these numerals into Arabic numerals: $V + C - X + C$ = 5 + 100 − 10 + 100.
7. We perform the addition to get 195.

Write the Roman numeral MCMLXXXVII in Arabic numerals.

1. We begin at the right of the number.
2. The first symbol is I.
3. The symbol to the left is of equal value, so we add them: $I + I$.
4. The symbol to the left of both of these is of higher value, so we add them again: $I + I + V$.
5. We continue this process, until the point when we have: $I + I + V + X + X + X + L + M$.
6. The symbol that is to the left of the M, C, is of lower value than M, so we take it away: $I + I + V + X + X + X + L + M - C$.

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7. The symbol that is to the left of C is of higher value, so we add it: $\mathrm{I + I + V + X + X + X + L + M - C + M}$.

8. We rewrite these Roman numerals into Arabic numerals: $\mathrm{I + I + V + X + X + X + L + M - C + M}$ = 1 + 1 + 5 + 10 + 10 + 10 + 50 + 1000 – 100 + 1000.

9. Finally, we perform the addition, to get 1987.

Writing a Roman Numeral

1. Separate the number into thousands, hundreds, tens, units etc. For example, write 2021 = 2000 + 20 + 1.

2. Translate each of these into Roman numerals. For example, $2000 + 20 + 1 = \mathrm{MM + XX + I}$.

3. Write them with the numeral for the largest number on the left, working down to the smallest number on the right. For example, $2021 = \mathrm{MM + XX + I = MMXXI}$.

Examples

Write 812 in Roman numerals.

1. 812 = 800 + 10 + 2.

2. $800 + 10 + 2 = \mathrm{DCCC + X + II}$.

3. $\mathrm{DCCC + X + II = DCCCXII}$.

Write 15,021 in Roman numerals.

1. 15,021 = 10,000 + 5,000 + 20 + 1.

2. $10{,}000 + 5{,}000 + 20 + 1 = \mathrm{\overline{X} + \overline{V} + XX + I}$.

3. $\mathrm{\overline{X} + \overline{V} + XX + I = \overline{XV}XXI}$.

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