



Global Mental Math Olympiad 2024

Referral Document

Challenger Category (Age : 6 years to 8 years)

Syllabus: -

- Mental Addition
- Mental Subtraction
- Tables / Multiplication
- Introduction to Exponents

To prepare for the Challenger Category of the Global Mental Math Olympiad 2024, we suggest that you practice Rounds 1 through Round 8 on our App.

Please note that Rounds 9 and 10 are not included in the syllabus, and therefore do not require your attention. Good luck with your training!

To gain a better understanding of the types of problems topic wise and their difficulty levels, please refer to the Sample Question Bank provided. They offer a comprehensive overview of the various types of problems and the degree of complexity involved.

NOTE - Please note that the referral material provided is intended as a reference. If your child is currently following a specific method, we recommend that you continue with that approach.

These resources are intended to support children who may be unfamiliar with certain mental math topics and are seeking additional assistance.



Topic 1-Mental Additions Methods

Sometimes, we find it difficult to add numbers which end in 6, 7, 8 and 9. For example, if we have $16+9$, that's a difficult problem to do mentally.

But we can make it easy. We can use a method called 'by addition and by subtraction'.

Method 1

Let us try $16 + 9$.

Since adding 9 directly is difficult for most of us, we add 10 which is easy to do mentally. So, since 9 is 1 less than 10, we can add 10 and then subtract 1 from our answer. Our sum looks like this:

We do:

- 1) $16 + 10 = 26$
- 2) $26 - 1 = 25$ is our answer.

Here, we would like to draw your attention to the method which is called 'by addition and by subtraction'. So, we add first and then subtract.

Let's take another example. Say, we have:

$$68 + 9$$

We do

$$68 + 10 = 78.$$

$$78 - 1 = 77 \text{ our answer.}$$

Now, let's try another example on our own.

$$59 + 8$$

$$\text{We do: } 59 + 10 = 69$$

Since 8 is 2 less than 10, we do:

$$69 - 2 = 67.$$

The answer is 67.



Now can you tell us what happens if one of the numbers Method being added was closer to 20?

Say, we have $116 + 18$

So, to add 18, we add 20 and then subtract the 2.

So, we do:

$$116 + 20 = 136$$

$$136 - 2 = 134. \text{ This is our answer.}$$

ACTIVITY 1

| Find the Sum | | | | | | | | | |
|--------------|----|-----|----|-----|----|-----|----|-----|----|
| 1 | 27 | 2 | 59 | 3 | 29 | 4 | 57 | 5 | 19 |
| | +5 | | +6 | | +9 | | +7 | | +7 |
| Ans | | Ans | | Ans | | Ans | | Ans | |



Method 2

Left to Right Mental Addition

This method is called Left to Right Mental Addition Method. So far traditionally in Maths, we have been doing additions and other operations from Right to Left.

However, we can also do mental addition effectively from Left to Right.

Say for example we have

$$\begin{array}{r} 88 \\ + 34 \\ \hline \end{array}$$

Step 1, we first add the figures in the left column.

So $8 + 3 = 11$ (We keep this figure in our head)

$$\begin{array}{r} 88 \\ + 34 \\ \hline 11, \end{array}$$

Step 2, we now add the figures in the Right Hand Column

$8 + 4 = 12$ (we keep this in our head too)

The sum now looks like this:

$$\begin{array}{r} 88 \\ + 34 \\ \hline 11, 12 \end{array}$$

Step 3, in the final step we add the middle digits

$$\begin{array}{r} 88 \\ + 34 \\ \hline 11, 12 \\ \hline 122 \end{array}$$

So, the answer is 122

| Find the Sum | | | | | | | | | |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 1 | 47 | 2 | 85 | 3 | 47 | 4 | 64 | 5 | 245 |
| | +88 | | +16 | | +29 | | +47 | | +257 |
| Ans | | Ans | | Ans | | Ans | | Ans | |



Topic 2- Mental Subtractions

Sometimes it becomes difficult to subtract numbers like 6, 7, 8, 9 from numbers ending in 1, 2, 3, 4, 5. This new method provides us with a different view and simpler approach, just like we saw in addition.

Say, we have $42 - 9$

We subtract 10 first (as it is easy to take away 10) and then add back 1 (since 9 is 1 less than 10).

$$42 - 10 = 32$$

So, $32 + 1 = 33$. This is the answer.

Let us take another example:

$$81 - 8$$

So, we subtract 10 first (as it is easy to add back 2 (since 8 is 2 less than 10)).

$$81 - 10 = 71$$

So, $71 + 2 = 73$ is the answer

Now let's try one with a slight variation!

$$43 - 17$$

So, we subtract 20 first (as it is easy to take away 20) and then add back 3 (since 17 is 3 less than 20).

$$43 - 20 = 23$$

So, $23 + 3 = 26$ is the answer.

| Find the Difference | | | | | | | | | |
|---------------------|----|-----|----|-----|----|-----|----|-----|----|
| 1 | 77 | 2 | 56 | 3 | 28 | 4 | 54 | 5 | 17 |
| | -9 | | -7 | | -9 | | -7 | | -9 |
| Ans | | Ans | | Ans | | Ans | | Ans | |



Topic 3-Introduction to Exponents

The exponent of a number says how many times to use that number in a multiplication.

It is written as a small number to the right and above the base number.

Exponential expression has two components i.e Base and Exponent.

Other names for exponent are index or power

8^2 → Exponent (Power/Index)

↓
Base

Here's another example: the base is 4, and the exponent is 3

$$4^3$$

An exponent tells us to multiply the base by itself that number of times. In our example, we will multiply the base of 4 by itself 3 times:

$$4^3 = 4 \times 4 \times 4$$

Once we write out the multiplication problem, we can easily evaluate the expression. Let's do this for the example we've been working with

$$4^3 = 4 \times 4 \times 4$$

$$= 16 \times 4$$

$$= 64$$

Another example: $9^2 = 9 \times 9 = 81$

(The exponent "2" says to use the 9 two times in a multiplication.)

Another example: $5^3 = 5 \times 5 \times 5 = 125$

(The exponent "3" says to use the 5 three times in a multiplication.)



References

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