



Mental Addition and Subtraction

Before writing out a calculation, it's always good to check if there is a quicker way to solve it **mentally**.

Mentally means 'in your head', or without writing things down.

The most useful tool for this is knowing your **number facts**. These are the basic calculations (like $7 + 5 = 12$) that you know by heart!



Mental strategies

1

You can always **extend number facts** that you already know to find more!

Let's use the example of $12 + 24 = 36$.

Find the inverse operations

$$\begin{aligned} 36 - 12 &= 24 \\ 36 - 24 &= 12 \end{aligned}$$

Add/subtract by the same amount

$$\begin{aligned} 12 + 34 &= 46 & \begin{smallmatrix} +10 & +10 \end{smallmatrix} \\ 13 + 23 &= 36 & \begin{smallmatrix} +1 & -1 \end{smallmatrix} \end{aligned}$$

Increase or Decrease Place Value

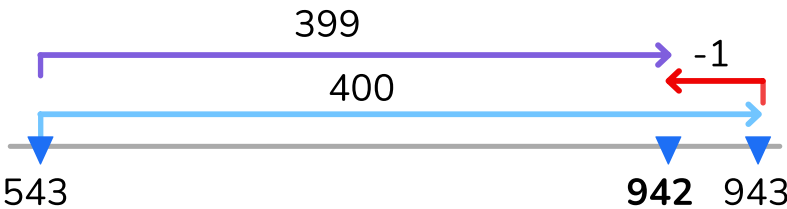
$$\begin{aligned} 1.2 + 2.4 &= 3.6 & \begin{smallmatrix} \div 10 & \div 10 & \div 10 \end{smallmatrix} \\ 120 + 240 &= 360 & \begin{smallmatrix} \times 10 & \times 10 & \times 10 \end{smallmatrix} \end{aligned}$$

2

Use **rounding** to calculate **additions** with numbers that are almost round!

If we need to **add 399 to 543**, we can add 400 instead, and then subtract 1 to adjust our calculation back to 399.

$$\begin{aligned} 543 + 399 &= ? \\ 543 + 400 - 1 &= 942 \end{aligned}$$

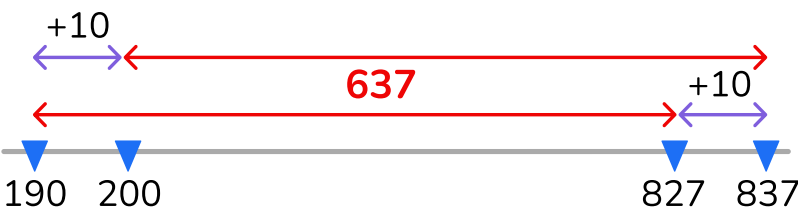


3

Use **rounding** to calculate **subtractions** with numbers that are almost round!

Let's say we want to find $827 - 190$. We can round 190 up to 200 to make this easier! We just need to add 10 to 827 so the difference stays the same!

$$\begin{aligned} 827 - 190 &= ? \\ +10 & \quad +10 \\ 837 - 200 &= 637 \end{aligned}$$



Example Question

Given that $329 + 112 = 441$, work out the answer to:

$$3,240 + 1,120$$

A 40,360

B 4,360

C 44,100

D 4,410

1

We know that $329 + 112 = 441$. We can use this as a number fact!

2

Let's compare this to the calculation we need to solve.

We can see that the two numbers being added are **10 times bigger** than the ones in the number fact.

$$\begin{aligned} 329 + 112 &= 441 \\ \downarrow \times 10 & \quad \downarrow \times 10 & \quad \downarrow \times 10 \\ 3,290 + 1,120 &= 4,410 \end{aligned}$$

3

The new calculation still isn't exactly right. What else is different?

We need to **subtract 50** from the first number to get 3,240. This means we also have to **subtract 50 from the sum!**

$$\begin{aligned} 3,290 + 1,120 &= 4,410 \\ \downarrow -50 & \quad \downarrow -50 \\ 3,240 + 1,120 &= 4,360 \end{aligned}$$

✓

The correct answer is **4,360**!

$$\begin{aligned} 329 + 112 &= 441 \\ 3,290 + 1,120 &= 4,410 \\ 3,240 + 1,120 &= 4,360 \end{aligned}$$

We started by **increasing the place value**

Then we **subtracted 50** on both sides