# Using BODMAS (also called BIDMAS) to solve calculations

In maths, we agree on a standard order for carrying out calculations, so everyone gets the same answer. That order is remembered as **BODMAS / BIDMAS**.

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**THE ACRONYM**

| | | |
|---|---|---|
| **B** | → | **Brackets:** do what's inside first |
| **O / I** | → | **Orders / Indices:** powers and roots |
| **D** | → | **Division** |
| **M** | → | **Multiplication** |
| **A** | → | **Addition** |
| **S** | → | **Subtraction** |

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**The Golden Rule**

- Work Brackets, then Orders (square roots or indices like square numbers and cube numbers).

For the remaining operations:

- Division and Multiplication have equal priority - work them left to right.
- Addition and Subtraction also have equal priority - work them left to right.

Do not try to "do all the multiplications before any divisions" - follow the left to right rule at each priority level.

**SATs tip:** if you're stuck, underline each operation you'll do next in order. It reduces mistakes.
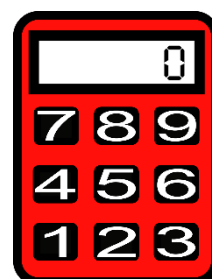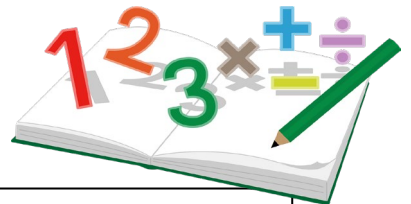
# Introduction to BODMAS

So BODMAS tells us the order we need to complete operations in.

First work out the **bracket** then any **orders/indices** (powers and roots).
Next do **division** and **multiplication** from left to right,
and finally, **addition** and **subtraction** from left to right.

Put your knowledge of BODMAS into practice by having a go at the following calculations:

1. $6 + 3 \times 4 =$

   _____

2. $4 \times 2 - 5 =$

   _____

3. $(4 + 1) \times 2 =$

   _____

4. $7 \times 3 - 8 =$

   _____

5. $3 + (4 \times 2) =$

   _____

6. $(3 + 4) \times 2 =$

   _____

7. $9 + 3 \div 3$

   _____

8. $(9 + 3) \div 3 =$

   _____

# Harder Worked Examples

These examples are longer and include orders/indices (powers and roots).

Follow the order of operations carefully:

- Brackets → Orders/Indices → Division & Multiplication (left to right) → Addition & Subtraction (left to right)

- Treat $\sqrt{}$ and powers (e.g. $3^2$), as Orders/Indices

1. $\sqrt{81} + 5 \times 3 =$

   _____

2. $2^3 + 30 \div 5 =$

   _____

3. $24 \div 3 \times 5 =$

   _____

4. $(7 - 1) \times 6 =$

   _____

5. $(15 - 9) \div 3 + \sqrt{49} =$

   _____

6. $24 \div (3 + 5) \times 6 =$

   _____

7. $4 \times 5^2 - 6 =$

   _____

8. $(6^2 - 4^2) \div 4 =$

   _____

9. $(21 - 5 \times 3)^2 + 7 =$

   _____

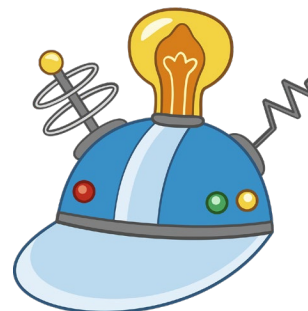10. $(\sqrt{64} \div 2^2)^3 =$

    _____

# Mixed Questions (Hardest)

Use: Brackets → Orders/Indices → Multiplication & Division (left to right) → Addition & Subtraction (left to right)

Watch out:

- Negatives with powers e.g. $(-2^2) = 4$ but $-(2^2) = -4$
- Roots/functions count as orders
- Fraction bars group top & bottom

1. $(5^2 - 7) \div 3 \times 2 =$

   _____

2. $18 \div 3 \times (2 + 4) =$

   _____

3. $(16 - \sqrt{64})^2 \times 2 + 5 =$

   _____

4. $\dfrac{9 + 9^2}{2 \times 3} - 7 =$

   _____

5. $(30 - 2^3) \div 4 + 1 =$

   _____

6. $(6 + 4^2) \div 2 \times 3 =$

   _____

7. $(25 - \sqrt{81}) \times 2 + 7 =$

   _____

8. $(-3)^2 + 20 \div (5 - 3) =$

   _____

9. $(7 + 5^2) - \sqrt{81} \times 2 =$

   _____

10. $-3^2 + (4 - 1)^3 + 7 =$

   _____

# Answers

## Introduction to BODMAS

1) 18
2) 3
3) 10
4) 13
5) 11
6) 14
7) 10
8) 4

## Harder Worked Examples

1) $\sqrt{81} = 9$

   $5 \times 3 = 15$

   $9 + 15 = 24$

2) $2^3 = 8$

   $30 \div 5 = 6$

   $8 + 6 = 14$

3) $24 \div 3 = 8$

   $8 \times 5 = 40$

4) $7 - 1 = 6$

   $6 \times 6 = 36$

5) $15 - 9 = 6$

   $6 \div 3 = 2$

   $\sqrt{49} = 7$

   $2 + 7 = 9$

6) $3 + 5 = 8$

   $24 \div 8 = 3$

   $3 \times 6 = 18$

7) $5^2 = 25$

   $4 \times 25 = 100$

   $100 - 6 = 94$

8) $6^2 = 36, 4^2 = 16$

   $36 - 16 = 20$

   $20 \div 4 = 5$

9) $21 - 5 \times 3 = 21 - 6$

   $(6)^2 = 36$

   $36 + 7 = 43$

10) $\sqrt{64} \div 2^2 = 8$

    $8 \div 4 = 2$

    $2^3 = 8$

**Mixed Questions (Hardest)**

1) $5^2 - 7 = 25 - 7 = 18$

$18 \div 3 = 6$, $6 \times 2 = 12$


2) $2 + 4 = 6$

$18 \div 3 = 6$

$6 \times 6 = 36$


3) $16 - \sqrt{64} = 16 - 8 = 8$

$8^2 = 64$

$64 \times 2 = 128$

$128 + 5 = 133$


4) $9 + 9^2 = 9 + 81 = 90$

$2 \times 3 = 6$

$90 \div 6 = 15$

$15 - 7 = 8$


5) $30 - 2^3 = 30 - 8 = 22$

$22 \div 4 = 5.5$

$5.5 + 1 = 6.5$


6) $6 + 4^2 = 6 + 16 = 22$

$22 \div 2 = 11$

$11 \times 3 = 33$


7) $25 - \sqrt{81} = 25 - 9 = 16$

$7 \times 2 = 14$

$16 + 14 = 30$


8) $(-3)^2 = 9$

$5 - 3 = 2$

$20 \div 2 = 10$,

$9 + 10 = 19$


9) $7 + 5^2 = 7 + 25 = 32$

$\sqrt{81} = 9$, $9 \times 2 = 18$

$32 - 18 = 14$


10) $-3^2 = 9$

$(4 - 1) = 3$; $3^3 = 27$

$9 + 27 + 7 = 43$