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# Order of Operations & Rounding Numbers

## Solutions & Answer Key

Full worked solutions, marking scheme & answer key

IGCSE Mathematics

The Panda Math Tutor

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Companion to the *Student Worksheet*

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**Note**

**About this booklet.** These are the complete solutions to every question in the *Order of Operations & Rounding Numbers — Student Worksheet*. Question numbers match exactly: the BIDMAS questions B1–B11, decimal-place questions D1–D6, significant-figure questions S1–S6, nearest-10/100/1000 questions N1–N4, truncation T1–T4, estimation E1–E5, bounds U1–U7, the Mixed Review MR1–MR10, and the examination questions Q1–Q8.
Each solution names the rule being used and works one operation at a time, exactly as the notes recommend. Part V collects the common mistakes to watch for, and Part VI is a quick answer key for fast marking.

# 4 Part IV — Complete Solutions

**Note**

Each solution names the rule being applied and works one operation at a time, exactly as the notes recommend. Depth is scaled to difficulty — brief for basic questions, fuller for the harder ones.

## 4.1 Solutions — Order of Operations (BIDMAS)

**Solution B1**

Brackets first: $7 + 5 = 12$. Then $6 \times 12 = \boxed{72}$.

**Solution B2**

Indices first: $2^3 = 8$. Then $8 + 7 = \boxed{15}$.

**Solution B3**

Multiplication before subtraction: $3 \times 4 = 12$. Then $20 - 12 = \boxed{8}$.

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## Solution B4

Division and multiplication have equal priority, so work *left to right*:

$$48 \div 6 \times 2 = 8 \times 2 = \boxed{16}.$$

## Solution B5

Do the $\div$ and $\times$ first, then add/subtract left to right:

$$9 + \underbrace{24 \div 6}_{4} - \underbrace{2 \times 3}_{6} = 9 + 4 - 6 = 13 - 6 = \boxed{7}.$$

## Solution B6

**Error:** the student added before subtracting. Addition and subtraction have *equal* priority and must be done *left to right*.

$$20 - 8 + 5 = 12 + 5 = \boxed{17}.$$

## Solution B7

Innermost first — the index, then the round bracket, then the square bracket:

$$3 \times \big[20 - (3^2 - 4)\big] = 3 \times \big[20 - (9 - 4)\big] = 3 \times [20 - 5] = 3 \times 15 = \boxed{45}.$$

## Solution B8

The fraction bar groups the top and the bottom separately.

$$\text{Numerator: } 5^2 + 5 = 25 + 5 = 30, \qquad \text{Denominator: } 2^3 - 1 = 8 - 1 = 7.$$

$$\frac{30}{7} = \boxed{4\tfrac{2}{7}}.$$

## Solution B9

Inside the bracket, index before subtraction: $2^3 = 8$, so $10 - 8 = 2$. Then square, then multiply, then add:

$$4 + 3 \times (2)^2 = 4 + 3 \times 4 = 4 + 12 = \boxed{16}.$$

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# Preview ends here

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