



IB Physics — Topic 0

Significant Figures

Study notes · 完整复习笔记

1. Significant Figures

Counting rules

- Decimal numbers: find the first non-zero digit and count everything to the right of it. Trailing zeros ARE significant.
- Non-decimal (whole) numbers: trailing zeros are NOT significant.

Number	s.f.	Why
002.00	3	count from the 2: 2, 0, 0
0.02050	4	count from the 2: 2, 0, 5, 0
2.04	3	all three digits count
1.005	4	count from the 1: 1, 0, 0, 5
0.002455	4	count from the 2: 2, 4, 5, 5
2450	3	trailing zero not significant
10205	5	zeros between digits count
1000	1	all trailing zeros dropped

补充 A whole number like 1000 is ambiguous. Scientific notation removes the ambiguity: 1×10^3 is 1 s.f., 1.00×10^3 is 3 s.f.
用科学记数法可以明确表示有几位有效数字。

Rounding 四舍五入

542.48 rounded to:

2 s.f. → 540 (better written 5.4×10^2)

3 s.f. → 542

4 s.f. → 542.5

Exact halves — 3.25000 and 3.35000 to 2 s.f.:

Rounding half away from zero (the IB/standard school convention): 3.3 and 3.4

Rounding half to even (used by some calculators and software): 3.2 and 3.4

知道两种约定存在就行,IB 考试用“四舍五入”。

做题习惯 Round only at the very end. Carry the full calculator value through intermediate steps, otherwise rounding errors accumulate. 中间步骤不要提前四舍五入。

Significant figures in calculations 运算中的保留位数

Operation	Rule
Addition / subtraction	Answer keeps the fewest DECIMAL PLACES of any input
Multiplication / division	Answer keeps the fewest SIGNIFICANT FIGURES of any input



Examples

$3.21 + 4.2 = 7.41 \rightarrow 4.2$ has 1 d.p., so the answer is 7.4

$(27 \times 578) / 12.33 = 1265.7... \rightarrow 27$ has only 2 s.f., so the answer is 1.3×10^3

加减看小数位,乘除看有效数字——两条规则不能搞混。