

Basic Knowledge Refresher

Principles of Physics chapter 1

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**1.1—*Système International d'Unités*
(English: SI)**

- SI units vs derived units:

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1.2—Metric System and Prefixes

- Metric system uses powers of ____
- Metric prefixes:

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Significant Figures—Counting

How many significant figures in the following?

<u>1.0070</u> m	→	5 sig figs	} These all come from some measurements
<u>17.10</u> kg	→	4 sig figs	
<u>100,890</u> L	→	5 sig figs	
<u>3.29</u> × 10 ³ s	→	3 sig figs	
0.00 <u>54</u> cm	→	2 sig figs	
<u>3,200,000</u> mL	→	2 sig figs	← This is a counted value
5 dogs	→	unlimited	

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Significant Figures—Calculations

<u>Calculation</u>	<u>Calculator says:</u>	<u>Answer</u>
3.24 m × 7.0 m	22.68 m ²	23 m ²
3.24 m + 7.0 m	10.24 m	10.2 m
0.02 cm × 2.371 cm	0.04742 cm ²	0.05 cm ²
1818.2 lb + 3.37 lb	1821.57 lb	1821.6 lb
1818.2 lb × 3.23 ft	5872.786 lb·ft	5870 lb·ft
1.030 g × 2.87 mL	2.9561 g/mL	2.96 g/mL

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1.3, 1.11, 1.12, 1.13— Scientific notation

- 9087
- 0.000 000 000 471
- $8.67 \times 10^3 + 1.08 \times 10^4$
- $4.0 \times 10^{-10} - 2.45 \times 10^{-11}$
- $8.00 \times 10^3 * 1.10 \times 10^4$
- $4.60 \times 10^{-10} / 2.00 \times 10^{-11}$

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1.8—Converting Units

- How many mm are in 34.9 km?
- Convert 55 mi/hr to m/s (1 ft = 0.305 m).
- What is 480 cm³ in m³?
- Convert 9.80 m/s² to mi/hr².

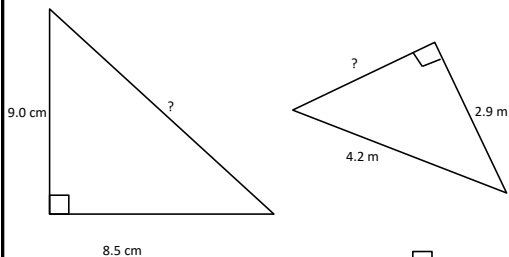
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1.10—Dimensional Analysis

- If the units for $m = \text{kg}$ and $F = \text{kg}\cdot\text{m}/\text{s}^2$, what are the units for a ? $F = ma$
- What are the units for G ?
 - $m_{1,2} = \text{kg}$; $r = \text{m}$; $F = \text{kg}\cdot\text{m}/\text{s}^2$.
 - $F = \frac{G \cdot m_2 \cdot m_1}{r^2}$

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1.17—Pythagorean Theorem



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