

1. Find the difference in **order of magnitude** for the following comparison: The size of the atom to the size of the nucleus.

$$\frac{\text{atom}}{\text{nucleus}} = \frac{10^{-10}}{10^{-15}} = 10^5 \quad \text{order is FIVE greater}$$

2. Convert 500 km h⁻¹ to m s⁻¹.

$$500 \frac{\text{km}}{\text{hr}} \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{1 \text{ hr}}{3600 \text{ s}} \right) = 138.9 \text{ m/s} \quad \text{~~138.9 m/s
$$\doteq 139 \text{ m/s}$$~~$$

3. Estimate how many kilograms are in a 225-pound person. (1kg = 2.2lbs) - No calculator

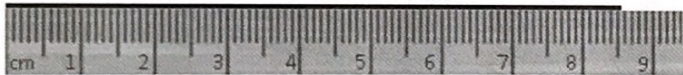
$$225 \text{ lb} \left(\frac{1 \text{ kg}}{2.2 \text{ lb}} \right) \doteq 100 \text{ kg}$$

4. Convert the quantity 125 km into its equivalent in mm.

$$125 \text{ km} \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{1000 \text{ mm}}{1 \text{ m}} \right) = 125 \times 10^6 \text{ mm}$$

$$= 1.25 \times 10^8 \text{ mm}$$

5. Find the line's length to the maximum number of significant figures allowed by the centimeter ruler.



8.5 cm or 85 mm

6. Determine the number of significant figures in each of the following.

(a) 0.0015 2 (b) 0.15 2 (c) 1.500 4 (d) 1.0005 5

(e) 1.00050 6 (f) 0.00010000 5 (g) 6.35 × 10⁶ 3 (h) 160 × 10⁻²¹ 3 ^{correction}
 3 sf if decimal place is present;
 2 sf if no decimal place

7. Compute the following quantities to the correct number of significant figures.

(a) 5.0000 × 2	(b) 5.0000 × 2.0	(c) 2.5 × 10 ⁻² - 2.5	(d) 2.5 × 10 ⁻² - 2.50
$\frac{10}{1 \times 10^1}$	$\frac{10.}{1.0 \times 10^1}$	$\frac{0.025 - 2.5}{}$ = -2.475 = -2.5 one decimal	$\frac{0.025 - 2.50}{}$ = -2.475 = -2.48 two decimals
(e) 2.5 × 10 ⁻² - 2.500	(f) 5.0000 ÷ 2	(g) 2.5 × 10 ⁻² - π	(h) 2.50 × 10 ⁻² ÷ 4.50
= -2.475	= 2.5 = 3 1 sig. fig.	= 0.025 - 3.1415... = -3.1165... = -3.117 3 decimal places	= 0.025 ÷ 4.5 = 0.00555 = 0.00556 = 5.56 × 10 ⁻³

correction