Numbers and Significant Figures Quiz

Name: Key

Question 1

Give the total number of significant figures and the position of the least significant digit in each quantity"

$1.250\ g$	6.022×10^{23}	$0.00215\ L$	$3500\ km$	$2.590 \times 10^{-7}\ m$
4, 10^{-3}	4, $10^{-3}(10^{20})$	3, 10^{-5}	2, 10^{2}	4, 10^{-3} (10^{-10})

Question 2

Give the solution to each expression with the proper number of significant figures

$x = 23.14\,cm + 4.105\,cm$ → 27.25 cm

$x = \dfrac{0.12\ mol}{1.53\ L}$ → $0.078 \frac{mol}{L}$

$x = 94\,\mu s - 8.7 \times 10^{-5} s$ → $7 \cdot 10^{-6}\ s$

$x = \dfrac{12.4\ g + 1.94\ g}{20.4\ cm^3 - 3.47\ cm^3}$ → $\frac{14.34\ g}{16.93\ cm^3} = 0.847\ g/cm^3$

Question 3

Later in this course we will use the following equation: $v_{rms} = \sqrt{\dfrac{3RT}{M}}$

Find the units of v_{rms} if R has units $\dfrac{J}{mol\ K}$, T has units K, M has units $\dfrac{kg}{mol}$, and $J \equiv \dfrac{kg\ m^2}{s^2}$

$\left(\frac{J}{mol\ K} \cdot K\right)^{1/2} \rightarrow \left(\frac{J}{kg}\right)^{1/2} \rightarrow \left(\frac{\frac{kg\ m^2}{s^2}}{kg}\right)^{1/2} \rightarrow \left(\frac{m^2}{s^2}\right)^{1/2} \rightarrow m/s$

Question 4

Complete the following table:

Decimal Quantity	Scientific Notation	Prefix Notation
$0.0045\ m$	$4.5 \cdot 10^{-3}\ m$	$4.5\ mm$
$36,000,000\ m$	$3.6 \cdot 10^{7}\ m$	$36\ Mm$
$0.000\ 000\ 560\ m$	$5.60 \times 10^{-7}\ m$	$560\ nm$ -or- $0.560\ \mu m$

Spaces exaggerated for clarity