Practice - Significant Figures

Key 13-14 phys

1. For each of the measurements in the table below, determine if the underlined number is significant or not significant. Place a check mark in the appropriate box and in the box under the rule that you used to make your determination.

Measurement	Significant	Not Significant	Rule				
			1	2	3	4	5
a. 3038 m	✓			✓			
b. 1.561 L	✓		✓				
c. 0.074 mm		✓			✓		
d. 5050 s		✓			✓		
e. 3.007 km	✓			✓			
f. 6.10°C	✓						✓
g. 821.0 g	✓		✓				
h. 0.560 g		✓			✓		

2. Determine the number of significant figures in each of the following measurements.

a. 56 m 2
b. 1104 mL 4
c. 15 pairs infinite
d. 0.20 mol 2
e. 105 000 mm 3
f. 6.02 L 3
g. 0.176 kPa 3
h. 819 000.0 g 7
i. 4.030 m^3 4
j. 0.005 42 s 3
k. 49 000 km 2
l. 7.81 kg 3
m. 7.01 m/s 3
n. 0.0021 m 2
o. 30 015 g 5
p. 90 km 1
q. 12.0 cm 3
r. 0.0305 kPa 3
s. 50 gross infinite
t. 83.90 m/s^2 4
u. 0.100 50 cg 5
v. 0.0510 kg 3
w. 6.12×10^5 mm 3
x. 4.01×10^2 s 3
y. $60\,000 \times 10^3$ g 1
z. 1.000×10^2 kPa 4

3. Round each of the following to 3 significant figures.

a. 137928 g 138 000
b. 33.85 m 33.9 (33.8 w/o te rule)
c. 33.78 L 33.8
d. 0.30333 mL 0.303
e. 3.996 mg 4.00
f. 33.73 m 33.7
g. 0.03353 kg 0.0335
h. 33.747 cm 33.7
i. 32.55 cL 32.6

4. Complete the following calculations, expressing your answer with the correct number of significant figures and the proper units.

a. $\begin{array}{r} 201.2\ \text{m} \\ +31.37\ \text{m} \\ \hline \end{array}$

$232.57 \rightarrow \boxed{232.6\ \text{m}}$

b. $\begin{array}{r} 143.2\ \text{s} \\ 1.23\ \text{s} \\ +135.31\ \text{s} \\ \hline \end{array}$

$279.74 \rightarrow \boxed{279.7\ \text{s}}$

c. $22.6\ \text{m} \times 3.7\ \text{m} =$ $83.62 \rightarrow \boxed{84\ \text{m}^2}$

d. $\dfrac{0.000312\ \text{m} \times 6973\ \text{m}}{20.2\ \text{m}} =$ $0.1077017822 \rightarrow \boxed{0.108\ \text{m}}$

e. $\dfrac{14235\ \text{s} \times 427.6\ \text{s}}{18793\ \text{s}} =$ $323.8911297 \rightarrow \boxed{323.9\ \text{s}}$

f. $\begin{array}{r} 191.47\ \text{L} \\ -12.32\ \text{L} \\ \hline \end{array}$

$179.15 \rightarrow \boxed{179.15\ \text{L}}$

g. $\begin{array}{r} 2 \times 10^{23} \\ +4.99 \times 10^{22} \\ \hline \end{array}$

$2.499 \times 10^{23} \rightarrow \boxed{2 \times 10^{23}}$

h. $19.31\ \text{s} \times 0.107\ \text{s} =$ $2.06617 \rightarrow \boxed{2.07\ \text{s}^2}$

i. $\dfrac{375.212\ \text{kg}}{0.0009\ \text{kg}} =$ $416902.222 \rightarrow \boxed{4 \times 10^5}$

j. $\dfrac{101\ \text{L} + 0.11\ \text{L}}{0.0101\ \text{s} \times 12.0\ \text{s}} =$ $\boxed{835\ \text{L/s}^2}$

$101.11 \rightarrow 101$

$0.1212 \rightarrow 0.121$

$= 834.7107438$

5. Complete the following problems showing all work using proper dimensional analysis. Be sure to express your answer with the correct number of significant figures. Don't forget to included correct units and box your answer.

a. $1.2000\ \text{mm} =$ __?__ km

$$1.2000\ \text{mm} \times \frac{1\ \text{m}}{1000\ \text{mm}} \times \frac{1\ \text{Km}}{1000\ \text{m}} = 0.000012 \rightarrow \boxed{1.2000 \times 10^{-5}\ \text{Km}}$$

b. $2.00\ \text{in/s} =$ __?__ mi/hr

$$\frac{2.00\ \text{in}}{1\ \text{s}} \times \frac{1\ \text{ft}}{12\ \text{in}} \times \frac{1\ \text{mi}}{5280\ \text{ft}} \times \frac{60\ \text{s}}{1\ \text{min}} \times \frac{60\ \text{min}}{1\ \text{hr}} = 0.113636364 \rightarrow \boxed{0.114\ \text{mi/hr}}$$