

Chemistry 11

ANSWER KEY - Section #3 Quiz

ANSWER TO QUESTION #1

$$100.4 + 96.14 + 88.0092 = 284.5492 \text{ (unrounded answer)}$$

↑

**Least precise input number
(precise to 1st decimal place)**

The least precise input number goes to the 1st decimal place, so round the answer to the 1st decimal place.

$$\text{ANSWER} = 284.5$$

ANSWER TO QUESTION #2

$$28.461 - 17.1 = 11.361 \text{ (unrounded answer)}$$

↑

Least precise input number

The least precise input number only goes to the 1st decimal place, so round the answer to match it.

$$\text{ANSWER} = 11.4$$

ANSWER TO QUESTION #3

$$\begin{array}{r} 3.69 \div 0.011 = 335.4545455 \text{ (unrounded answer)} \\ \text{3 sig.figs.} \quad \text{2 sig.figs.} \end{array}$$

0.011 has the fewest number of significant figures – two. Therefore the answer must also be rounded to two digits.

$$\text{ANSWER} = 340$$

(In scientific notation this would be 3.4×10^2)

ANSWER TO QUESTION #4

$$\text{Density} = \text{Mass} \div \text{Volume}$$

$$\text{Density} = \underset{\substack{4 \text{ sig.figs.}}}{(24.12 \text{ grams})} \div \underset{\substack{5 \text{ sig.figs.}}}{(5.4971 \text{ cm}^3)} = \underset{\substack{\text{(unrounded answer)}}}{4.387\,768\,096 \text{ g/cm}^3}$$

24.12 has the fewest number of significant figures – four. Therefore you must round the answer to match it.

$$\text{ANSWER} = \mathbf{4.388 \text{ g/cm}^3}$$

****To be truly correct, the answer must show the correct units.****

.....

ANSWER TO QUESTION #5

$$86,320 - 1.46 = 86,318.54 \text{ (unrounded answer)}$$

↑
Precise to
10's place

86,320 is the least precise input number, so round the answer to match it.

$$\text{ANSWER} = \mathbf{86,320}$$

.....

ANSWER TO QUESTION #6

The standard uncertainty of a ruler is $\pm 1 \text{ mm}$.

So the stated uncertainty of the measurement would be: $249 \pm 1 \text{ mm}$.

$$\text{Percent Uncertainty} = \frac{(\pm 1 \text{ mm})}{(249 \text{ mm})} \times 100 = 0.401\,606\,425 \%$$

****There is only one digit in $\pm 1 \text{ mm}$, so round the answer to one digit.****

$$\text{ANSWER} = \mathbf{0.4\%}$$

ANSWER TO QUESTION #7

Before doing your calculations, you must ensure that all of the input numbers have the same units.

We have been given the following measurements: 4.21 m, 118.9 cm, 17.901 dm.

Therefore it would be a good idea to convert them all to units of EITHER m, cm, or dm. In this example the measurements are converted to units of metres.

If you are unsure about how to do this, then review Section #1.

$$\begin{aligned}4.21 \text{ m} &\rightarrow 4.21 \text{ m} \\118.9 \text{ cm} &\rightarrow 1.189 \text{ m} \\17.901 \text{ dm} &\rightarrow 1.7901 \text{ m}\end{aligned}$$

Now you can add them together –

$$\begin{array}{r}4.21 \rightarrow \text{least precise (2}^{\text{nd}} \text{ decimal place)} \\1.189 \\ \underline{1.7901} \\7.1891 \text{ (unrounded)}\end{array}$$

Next, round the answer to match the least precise input number.

$$\text{ANSWER} = 7.19 \text{ m}$$

****If you converted to units of dm, then ANSWER = 71.9 dm. ****

****If you converted to units of cm, then ANSWER = 719 cm. ****

ANSWER TO QUESTION #8

Area of Rectangle = Length x Width

$$\begin{array}{r} \text{Area of Floor} = (1.07 \times 10^3 \text{ cm}) \times (8.921 \times 10^2 \text{ cm}) = 9.54547 \times 10^5 \text{ cm}^2 \\ \begin{array}{ccc} 3 \text{ sig.figs.} & 4 \text{ sig.figs.} & \text{unrounded answer} \\ \uparrow & & \\ \text{Fewest sig.figs.} & & \end{array} \end{array}$$

Round the answer to match the input number that has the fewest significant figures.

$$\text{ANSWER} = 9.55 \times 10^5 \text{ cm}^2 \quad \text{or} \quad 955,000 \text{ cm}^2.$$