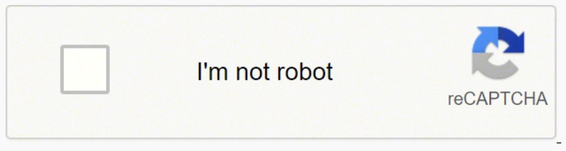

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Density calculations with significant digits worksheet answers

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Significant Figures Worksheet

1) Determine the number of significant figures in each of the following:

a) 4 75.02mm
b) 4 18.90 mL
c) ∞ 12 test tubes
d) 2 0.0049 g
e) 2 150 cm
f) 3 150. Cm

2) Re-write the quantity 827,000,000,000,000 picoseconds to show:

a) 1 sig. fig. 8×10^{14} ps
b) 2 sig. figs. 8.3×10^{14} ps
c) 3 sig. figs. 8.27×10^{14} ps
d) 4 sig. figs. 8.270×10^{14} ps
e) 5 sig. figs. 8.2700×10^{14} ps

3) Rewrite the quantity 0.0031904 kg to show:

a) 1 sig. fig. 0.003 Kg
b) 2 sig. figs. 0.0032 Kg
c) 3 sig. figs. 0.00319 Kg

4) Round each of the following to 3 significant figures:

a) 16.8477 L 16.8 L
b) 5.6732 5.67
c) 0.14986 L 0.150 L
d) 861.85 862
e) 4.203×10^{4} km 4.20×10^{4} km
f) 5.0981×10^{-3} 5.10×10^{-3}
g) 0.00318756 m 0.00319 m
h) 0.09025011 0.0903

Significant Figures

Remember: The first significant figure is the first number that is not zero

5 or more goes up 455 → 455 → 500 (to 1 s.f.)
4 or less stays same 436 → 436 → 400 (to 1 s.f.)

Round to 1 significant figure (1 s.f.)

Number	Identify sig. fig.	Possible answers	Draw line	Up or stay	Answer
5605	5605	5000 or 6000	5|605	Up	6000
9301					
7842					
856					
12					
98					
0.0821	0.0821	0.08 or 0.09	0.08|21	Stay	0.08
0.0372					
0.0067					
0.2118					
0.035					
0.096					

Round to 2 significant figures (2 s.f.)

Number	Identify sig. fig.	Possible answers	Draw line	Up or stay	Answer
638	638	630 or 640	63|8	Up	640
5892					
7106					
0.0157					
0.5622					
12.61					
3.274					

Although there are several convention, in this text we will adopt the following rule: the final response should be rounded if the first dagged dagito is 5 or more, and rounded if the first dagged dagito is less than 5. The fall in positions In sums and differences it brings the topic of rounding. This procedure is intended to reinforce the rules to determine the number of significant number of no., But in some cases it may give a final response that differs in the last one obtained by using a calculator, where all the dagitoes are transported to the last step. If the right one immediately the right of the last significant was less than 5, it will be withdrawn and the value of the last significant dagito will remain the same. 217 Â · 903 13.77 + 908.226 + 515 255.0 Ã ¢ '99 0.00666 Ã £ -321 Answer A: \ (0.240 = 2.40 \ Sometimes 10^{-1} \) Answer B: \ (1,437 = 1.437 \ Times) Answer C: \ (156 = 1.56 \ Times 10^2 \) Answer D: \ (2.14 = 2.14 \ Times 10^0 \) Remember that calculators do not understand significant no. One of the most common uses of density is how different materials interact when mixed. Before dealing with the specificities of the rules to determine significant numbers in a calculated result, we need to be able to round the noºMeros correctly. As successive rounding can aggravate inaccuracies, intermediate rounding needs to be treated correctly. You are who should apply the significant rules for the result of your calculator. After knowing this, among so many dagitos, from the left. If the right immediately of the significant last one is greater than or equal to 5, the last significant wicker will be increased in 1. Example \ (\ Pageindex {1} \) Write the answer for each expression using unnotation the scientific with the appropriate number of significant numbers. Thanks for your participation! Learning objectives use correctly significant in Operations. In other words, the density is the reason between mass and volume or mass per unit of volume. (Note that the asterisk's sambolo is Ády Â € * is used to avoid confusing with the variables â € hys for volume and density, ã and v, respectively. The density can also be in the dwarf of some situations, as always a conversation is occurring and the energy is being released. Follow the process as described in the table \ (\ Pageindex { 1} \). As the density of common substances is known, this calculation is quite straightforward, in form. The rule, in addition, and the subtraction is that the answer receives The same number of decimal places as the term with the lowest number of decimal places. To calculate the density (usually represented by the Greek letter "ã?) of an object, take the mass (m) and divide by volume (V): Ã? = m / v The density unit si © kilogram per metering cycle (kg / m3). return from the final answer. In the scientific note, all the no significant mere explicitly listed. As the battery discharges the electricity, the occurrence combines with the lead on the battery to form a new quantum product, which results in a decrease in the density of solution. For this problem, take a salt brick measuring 10.0 cm x 10.0 cm x 2.0 cm, which weighs 433 grams. When studying the density, it may be to work a sample problem using the density fanmula, as mentioned in the previous section. At the moment, the measurement contains significant six. The density is essentially a measure of rigorously the maturity is pile up. The charge on a storage battery, for example, is a solution. The first Dagit fell © 1, so we not round. \ (1.13 \ Times 10^3 \) How do the significant numbers are treated in the screen? An example is the following: the final answer, The four significant no. It is © 4,094. The principle principle The density was discovered by the archimes of Greek scientists, and it is fancil to calculate if you know the fanmula and understand your related units. Around the final response to centrals, since 15.99, has its most distant significant figure at the central site (less accurate). When working on paper, however, we usually want to minimize the number of dagitos we have to write. This density can be measured to determine the remaining battery charge. Example \ (\ Pageindex {2} \) 13.77 + 908.226 1,027 + 611 + 363.06 Solution One Explanation Answer The calculator response © 921.996, but because 13.77 has its farthest, farthest figure, farther. In the central place, we need to round the final response from the final to the central position. For example, if you add 1.2 and 4.71, we observe that the first number interrupts its significant no. To find the density, use the fanmula, which helps determine the amount of mass per unit volume or: ã§ Mother/ V In this example, you have the dimensions of the object, so that you need to calculate the volume. If the calculation is an addition or a subtraction, the rule will be as follows: Limit the reply reported in the right column that all numbers are not significant in common. The density of a material is defined as its mass per unit of volume. 59.35 g of centrals placed - 35.5 g dá © chs place (less accurate) = 23.85 g around the final response. In the operations involving significant numbers, the answer is reported in such a way that it reflects the reliability of the least accurate operation. The wood floats in the water because it has a lower density, while a anchor sinks because the metal has a higher density. The horn balloons float because the density of the horn is less than the density of the Density is a -chave concept to analyze how materials interact in fluid, weather, weather, climate, climate Materials, engineering and other fan fields. 5 (1.008S) - 10.66 S 99.0 cm+ 2 (5.56 cm) Answer to -5.62 S Response B 110.2 cm Summary Summary If the number to be discarded is greater than or equal to 5, Increase the number of left by 1 (for example. 2,9699 rounded for three significant paragraphs © 2.97). For example, the divisive of 125 by 307 in a calculator provides 0.4071661238 ... to an infinite number of dagitos. 208.2 S c. We lowered the last one - the 1 - because it is not significant for the final response. You simply include all significant numbers in the main number. In doing so, we will show the results only for the correct number of significant numbers allowed for this step, treating each step as a separate calculation. 2 (35.45 s 4 SIG Figs) = 70.90 s 4 SIG Figs The number of significant number of significant number is 35.45; The number 2 is an exact number and therefore has an infinite number of significant no. The hydrae 'has vain calibrated objects, some of which float in the wool. The scientific notion provides a way of communicating significant unmouven as ambiguity. Therefore, we limit our response to the column of the dimensions. Round the final response to the local basis based on 137.3 s. It is important to be aware of significant numbers when you are mathematically manipulating no. When working on paper, there is always an intermediate result to retain at least one more dagito than can be justified and carry this number for the next stage of the cell. A response is not more accurate than it is less needed to get the answer. 2,016 g MILLANS OF PLACE + 15.99 g of central places (less accurate) = 18,006 g Round the final response. The density allows you to solve mass and volume if the other quantity is given. 18.01 g (rounding) b. Round the final response to the place of the basis based 35.5 g. The rule in multiplication and division is that the final response must have the No significant number of no. To round up a number, first decide how many significant no. Example \ (\ Pageindex {3} \) 2 (1.008 g) + 15.99 g 137.3 s + 2 (35.45 s) \ ({118.7 g \ More than 2} - 35.5 g \ ) Solution a. Observing which of the objects float, the employees of the service may determine the density of the wool. 23,096 £ - 90,300 125 € ”9,000 Solutions An Explanation Answer The calculator response is 2,085,5688, but we need to round five significant. The fan of the volume depends on the shape of the object, but it is a simple track for a box: vã ¢ = length x width x thickness of 10.0 cm x 10.0 cm x 2.0 cmv = 200.0 cm3 Now that you have mass and volume, calculate the density, as follows: ã ã ,= Mother/ Vã Ã ¢ = 433 g/ 200.0 cm3ã? of salt is 2.165 g/ cm3. When its automotive service sticker tests woolly, such as the transmissive fluid, it will pour out part of the fluid in a hydran. 2 (1.008 g 4 SIG Figs) = 2.016 g 4 Figs the number of significant number of significant number of 1.008 g; The number 2 is an exact number and therefore has an infinite number of significant no. An object with a specific gravity smaller than one float in the water, while a greater specific gravity than one means that it sinks. How would we round it successively to less and less significant. This pânão was built from the containment of the following collaborators and edited (topically or extensively) by the Libretexts development team to meet the style, presentation and quality of the platform: Marisa Alviar-AgNew (Sacramento City College) Henry Agnew (UC Davis) A related concept is density is the specific (or even more appropriate, relative density) gravity of a material, It is the ratio between material density and water density. If the number to be discarded is of 5, there is no change (for example, 4,00443 rounded to four significant no. © 4.004). Video \ (\ Pageindex {2} \): In the examples worked in this text, we will usually show the results of intermediate steps in a track. Consider the measurement \ (207.518 \: \ text {m} \). Then perform the addition. \ (2.001.06 = 2.001 \ Sometimes 10^3 \) Exercise \ (\ Pageindex {2} \) Write the answer for each expression using scientific grade with the appropriate number of significant numbers. Number of significant number of Racing Table of Round Value \ (\ Pageindex {1} \): Examples of rounding 6 207.518 All Significant Damites 5 207.52 8 Rounds, 1 AT © 2 4 207.5 2 ã © Discarded 3 208 5 rounds, the 7th at © 8 2 210 8 is replaced by a 0 and wheel the 0 ation 1 200 1 is replaced by a warning of 0 that the more rounding is done, the less Trust is the figure. An approximate value may be sufficient for some proportion, but scientific work requires a much higher detail. For example, the number 450 has two significant no. And would be written in scientific note as 4.5 Âƒ-102, while 450.0 has four significant no. Mathematical, there are two rules to limit the number of significant numbers in a response - a rule is for addition and subtraction, and a rule is for multiplication and division. For multiplication or divisive, the rule is to count the number of significant number of no. In every number multiplied or divided and then limit significant numbers in the lower count response. The final answer is rounded to the correct number of significant no. In the case of transmissive fluid, this test reveals whether the employees of the service estate need to replace it immediately or if the fluid still some life in it. It is this principle that allows, for example, a full balloon Hot air to float on the rest of the air. But the dagitos in this answer are some practical meaning, especially when you are starting with no. In the practical, the quamics usually work with a calculator and take all the dagitos ahead through subsequent boards. \ ({118.7 g \ More than 2} \) 4 SIG Figs = 59.35 g 4 Sig Figs The smallest number of significant no. The number 2 is an exact number and therefore has an infinite number of significant no. Explanation Answer 2 (1.008 g) + 15.99 g = perform the first multiplication. As the first dagito to be discarded (in the local milhan) is greater than 5, we round to 922.00 \ (922.00 = 9.2200 \ Teams 10^2 \) B Answer the calculator provides 2.001.06 as response, but Because 611 and 1027 has its numbers significant more distant, the place, the final response must be limited to the position. 23.9 g (rounding) Exercise \ (\ Pageindex {3} \) Complete the tracks and report their answers using the correct number of significant numbers. Like the first dagito to be discarded (in the local dating) is greater than 5, we round to 2,085.6. \ (2,0856 \ Times 10^3 \) B Explanation Answer the calculator provides 1,125 as a response, but we limit it to significant other. Remember that while density is actually divided into volume, it is often measured in gram units per centimeter cycle because grams represents a standard weight, while the centimeters cycle represent the volume of the object. It is a measure of how much "material" an object has in a unit volume (meter pit or centimeter cycle). It is also often represented in the CGS unit of grams per centimeter cycle (g/cm3). Explanation Answer \ ({118.7 g \ More than 2} - 35.5 g \) = Run the first divisive. Video \ (\ Pageindex {1} \): Significant figures in operations (. This In which type of calculation is being performed. Explanation Answer 137.3 S + 2 (35.45 s) = Run the first multiplication. Run the subtraction then. Next.

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