Question 1: How many significant figures are in each number below?

Question	Number	Sig Figs
1	10,000	
2	200	
3	3.93×10^{6}	
4	0.07	
5	1,000,000.	
6	480	
7	481	
8	481.00	
9	2.983×10^{-12}	
10	3.0080×10^{-10}	
11	0.5	
12	2,093,021	
13	1×10^{-14}	
14	0.000404	
15	20,300	
16	8,230,102,109	
17	6.02×10^{-23}	
18	12,000,000.	
19	70,300.	
20	0.000902	

Question 2: Write the answer to each calculation below. Be sure to use the correct number of sig figs in the answer. Hint: Remember that the rule for multiplication/division is different than for addition/subtraction.

1 / 1204 =

23 x 302 / 9.2 =

1.000 / 3.0 x 200. =

(270 x 5.8) / (0.020020 x 1.4) =

30. + 62.0 - 18.00 =

2.01 / (100.000 x 0.00990) =

Question 3: Your best friend decided to take biochemistry and is confused on the topic of sig figs. Below is one of her homework problems where she had to give the number of sig figs in each number. Go through each question and see if she is correct or incorrect. For the incorrect ones, give the correct number of sig figs and a brief explanation why her answer was incorrect.

Question	Number	Sig Figs	Correct/Incorrect?
1	35,000,000	8	
2	0.05004	4	
3	600	1	
4	$9.0x10^{-4}$	4	
5	$1.3x10^{-10}$	6	
6	1,001	4	
7	0.0004	4	
8	4.8	2	

Question 4: Label which quantities below are exact and inexact.

12 ounces of soda _____

10 fingers _____

2.4 liters of blood _____

8 pounds of cat food _____

two calcium tablets _____

Question 5: Which quantity is larger?

5 dL or 5 L _____

8.81 g or 8.81 mg _____

0.25 km or 0.25 m _____

1.30 m or 1.30 cm _____

Question 6: Perform the following temperature conversions.

Fahrenheit (°F)	Celsius (°C)	Kelvin (K)
212°F		
	37.0°C	
		298 K

Question 7: Calculate the density of each solution below.

- A medication that has a mass of 0.0032 kg in 0.00200 L.
- A 5.00 mL urine sample has a mass of 5.025 grams from a patient suffering from diabetes.
- Pepsi has a mass of 4.41 pounds in 2.0 liters.

Question 8: Use dimensional analysis to convert the quantities below between the English and Metric systems. I recommend using the Exam 1 Handout found in Module 5 to assist you.

- The human body contains roughly 170 fluid ounces of blood. What is the volume of blood in units of liters?
- In radiological imaging such as PET or CT scans, the proper dosage of medication is based on the patient's weight. If a patient weighs 142 pounds, what is the weight in units of kilograms?
- The height of a student is 84 cm. How tall is the student in units of inches?
- A juice container holds 0.500 quarts of liquid. How many milliliters is this?
- A human hair has a mass of 620 micrograms. What is the mass in ounces.

Question 9: Use dimensional analysis to solve the medication dosage calculations below.

- An extra strength tablet of Bayer contains 300 mg of aspirin, how many tablets are equal to 6 grams of aspirin?
- A doctor orders 0.280 mg of Synthroid, a drug used to treat reduced thyroid function. The medication label indicates that each tablet of Synthroid contains 70 mcg of the drug. How many tablets should be prescribed to the patient?
- Children's Chewable Tylenol contains 80 mg of acetaminophen per tablet. If the recommended daily dosage is 10 mg of drug per kg of body weight, how many tablets can a 36 pound child safely take?
- A physician orders 600 mg of aspirin. The drug label shows 200 mg per gel tablet. How many gel tablets of this antipyretic drug should you administer to the patient?
- The drug order is Lasix 40 mg taken by mouth (PO) daily. The drug comes in 20 mg tablets. If the patient is required to take this drug for 5 days, how many tablets should you administer in total?
- A bottle of Robitussin Adult Severe Multi-Symptom cough syrup is contains 120 mL. If one dose of 5 mL is given four times a day, how many days would the entire bottle last?

Question 10: Use density to perform the following unit conversions.

- If a patient has a blood cholesterol level of 1.85 g/L, how many grams of cholesterol does the patient have in total if the patient has 4.7 liters of blood.
- A sample of blood can be spun in a centrifuge to separate it into the red blood cells, white blood cells, and plasma. The blood plasma layer has a density of 1.025 g/mL. If plasma layer has a mass of 3.82 grams, what is the volume?