

Name

Key

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## HONORS CHEMISTRY QUIZ - MEASUREMENTS AND MATH

**MULTIPLE CHOICE** - Write the letter of the best possible answer to the left of the number.

- D 1. The curved surface that is formed when a liquid is poured into a graduated cylinder is called a(n)  
 A. hibiscus      B. concave lid      C. depression zone      D. meniscus

- D/A 2. A negative exponent written with a number in scientific notation means  
 A. the number is less than one  
 B. the number is greater than one  
 C. move the decimal to the right for standard notation  
 D. the decimal was moved to the left when it was put into standard notation

- C 3. When adding and subtracting with significant figures the answer must have  
 A. the same number of significant figures as the number with the least significant figures  
 B. the same number of significant figures as the number with the most significant figures  
 C. the same number of decimal places as the number with the least decimal places  
 D. the same number of decimal places as the number with the most decimal places

- B 4. The standard unit for volume is the  
 A. Angstrom      B. liter      C. kilogram      D. meter

- D 5. When multiplying and dividing with significant figures the answer must have the same significant figures as the number with  
 A. the most significant figures      C. the least decimal places  
 B. the most decimal places      D. the least significant figures

2 ea **SIGNIFICANT FIGURES:** How many significant figures are in each of the measurements below. Circle the significant figures.

6. 0.0302000g    6      10. 0.03407g    4  
 7. 30040g    4      11. 22000g    2  
 8. 0.000009g    1      12. 3.0g    2  
 9. 3.0x 10<sup>-4</sup>g    2

3 ea

**CALCULATIONS:** Your answer should contain the correct significant figures and the correct units.

24610.65

13.  $24,456 \text{ g} + 134 \text{ g} + 20.1 \text{ g} + 0.55 \text{ g} = \underline{24611 \text{ g}} \quad (\text{no d.p.})$

14.  $2.96 \text{ L} \div (4.0 \times 10^2) \text{ s} = \underline{.0074 \text{ L/s}}$

15.  $(3007 \text{ cm})(0.004 \text{ cm})(9.6 \times 10^1 \text{ cm}) = \underline{1000 \text{ cm}^3} \text{ or } \underline{1 \times 10^3 \text{ cm}^3}$   
1154.688

2 ea

**SCIENTIFIC NOTATION:** Convert the scientific notation to decimal form and the decimals to scientific notation. Show correct significant figures.

16.  $\overbrace{4.032}^{4 \text{ sig}} \times 10^5 = \underline{403200}$

17.  $\overbrace{50140}^{4 \text{ sig}} = \underline{5.014 \times 10^4}$

18.  $\overbrace{0.0034002}^{5 \text{ sig}} = \underline{3.4002 \times 10^{-3}}$

19.  $\overbrace{2.36}^{3 \text{ sig}} \times 10^{-3} = \underline{.00236}$

**DIMENSIONAL ANALYSIS:** Solve the following problems. Use unit analysis if appropriate. Use correct significant figures and units. **SHOW ALL WORK** and **circle your final answer**.

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20. Convert  $0.687 \text{ g/cm}^3$  to  $\text{lb/gal}$ .

$\overbrace{.687 \text{ g}}^{3 \text{ sig}} \times \frac{1 \text{ lb}}{454 \text{ g}} \times \frac{1 \text{ cm}^3}{1 \text{ mL}} \times \frac{1000 \text{ mL}}{1 \text{ L}} \times \frac{1 \text{ L}}{1.06 \text{ gal}} = \underline{5.71 \text{ lb/gal}}$

7  
-1 sig  
-1 unit  
-1 math  
-1 conv fact

21. The diameter of an atom is 1.95 Angstroms. When  $5.5 \times 10^9$  atoms are laid side by side, what is the length of the row in feet? (An angstrom is a metric unit of length and is abbreviated with an A.  $1 \text{ A} = 1 \times 10^{-8} \text{ cm}$ )

Facts:  $\underline{1.95 \text{ A}}$   
1 atom

$\frac{5.5 \times 10^9 \text{ atoms}}{1} \times \frac{1.95 \text{ A}}{1 \text{ atom}} \times \frac{1 \times 10^{-8} \text{ cm}}{1 \text{ A}} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in}} = \underline{3.5 \text{ ft}}$

- 1 math
- 1 sf
- 1 conv fact
- 1 units

version C

- 8) 22. Mrs. Higgins' peanut butter sandwich contains 980 calories. To burn 130 calories, she needs to walk 1.00 mile. One of Mrs. Higgins' steps is 0.900 meters. How many steps will Mrs. Higgins have to walk to burn the calories from 3 peanut butter sandwiches? (I was hungry!)

Facts:  $\frac{1 \text{ sand}}{980 \text{ cal}}$   $\frac{130 \text{ cal}}{1 \text{ mi}}$   $\frac{.900 \text{ m}}{1 \text{ step}}$

$$\frac{3 \text{ sand}}{1} \times \frac{980 \text{ cal}}{1 \text{ sand}} \times \frac{1 \text{ mi}}{130 \text{ cal}} \times \frac{1.6 \text{ km}}{1 \text{ mi}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ step}}{.900 \text{ m}} = 4.0 \times 10^4 \text{ steps}$$

40,456.41

40,000 steps  
-1 sf

- 3ea **Reading Scales.** Record the measurement of each scale. Include units.

- 1 sf
- 1 units
- 1 number if way off

23. Thermometer 37.0°C

24. Balance 480.50 g

25. Graduated Cylinder 40.0 mL

