

Name _____

Atmospheric Sciences 211 September 29, 2003

Math/Chem Quiz (This does not count toward your grade.)

Do not use an electronic calculator.

1. Arithmetic

(a) 25% of 40 =

(b) $\frac{1}{0.1} =$

(c) $2^3 =$

(d) $64^{1/2} =$

(e) $2^{-2} =$

(f) $\frac{25 \times 10^8}{5 \times 10^{-5}} =$

2. Express in Scientific Notation

(a) 0.00012 =

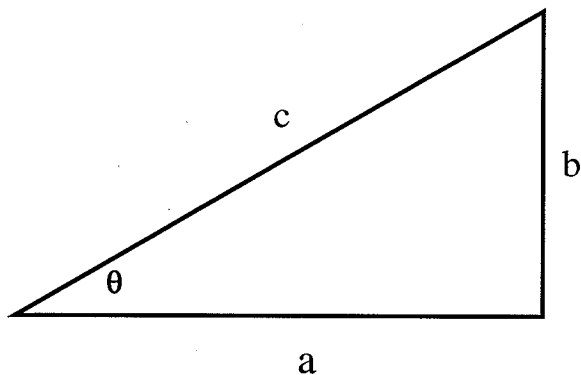
(b) 300,000 =

3. Geometry and Trigonometry

(a) The area of a circle of radius r is:

(b) The surface area of a sphere of radius r is:

(c) $\cos \theta = a/b, b/a, a/c, c/a, b/c, c/b$ [Circle the right answer.]



Continued Over . . .

4. Algebra

$PV = nRT$; solve for T .

5. **Functions.** Put the appropriate letter (a,b,c, or d) in front of each equation.
[Assume r is a positive constant.]

_____ $y = rt$ (a) y increments exponentially with t .

_____ $y = r/t$ (b) y is proportional to t .

_____ $y = r^t$ (c) y is inversely proportional to t .

_____ $y = t^r$ (d) y has power-law dependence on t .

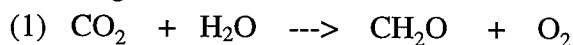
6. Conversion of units

(a) If your car can travel 20 miles on a gallon of fuel, and there are 4 quarts in a gallon, how many quarts are used on a 30-mile trip?

(b) In a hypothetical country with 200 million people, the annual budget of the federal government is one trillion dollars. What is the per-capita federal budget (i.e., what an average person can expect to pay in taxes)?

7. Chemistry:

a. Consider the following chemical reactions:



For reaction (1), there is/are _____ type(s) of atom(s) and _____ type(s) of molecule(s).

For reaction (2), there is/are _____ type(s) of atom(s) and _____ type(s) of molecule(s).

b. In what way(s) is ^{16}O different from ^{18}O (circle all that are appropriate)?

(a) mass (or atomic weight)

(b) number of electrons

(c) temperature

(d) number of atoms