Math 1030, Homework Activity #9, Summer 2014 Name KEY
Sections 5.6

Instructions: Complete the following problems. You may work alone or in a group. Do not just copy answers from a group member, but be sure that you understand the problem. Similar questions will appear on exams. You may be asked to explain or present the answers to the class. This assignment is due at the end of the class period.

1. Write the following numbers in scientific notation.
   a. 64,000,000 6.4×10^{7}
   b. 9,000,000,000 9×10^{9}
   c. 0.00000001 1×10^{-8}
   d. 0.000003 3×10^{-6}
   e. 401,090,000 4.0109×10^{8}
   f. 8 8×10^{0}
   g. 620 6.2×10^{2}
   h. 0.007 7×10^{-3}

2. Write the following numbers in decimal notation.
   a. 4.2×10^{6} 4,200,000
   b. 1×10^{8} 100,000,000
   c. 6.1×10^{-7} .00000061
   d. 5.4×10^{2} 540
   e. 7.05×10^{-9} .00000000705
   f. 8.2×10^{-3} .0082

3. The mass of an atom ranges from 1.67×10^{-27} to 4.52×10^{-25} kg. Write these numbers in decimal notation.
   .00000000000000000000000000167 — .00000000000000000000000452

4. As of April 14th, 2014 (at 5:05 GMT), the national debt is $17,547,737,996,234.38. Write this number in scientific notation with 3 significant digits.
   1.755×10^{13}

5. The nearest star is 4.243 light years from the Sun. (It's called Proxima Centauri.) Multiply this number by 365.25 to convert to light days, then by 24 to convert to light hours, then by 3600 to convert to light seconds. Then multiply that by 186,000 to convert to miles. Write the resulting number of miles in scientific and decimal notation.

   $4.243 \times 365.25 \times 24 \times 3600 \times 186{,}000 = 2.49\times10^{13}$ miles

6. A googol is a number that is equivalent to 10^{100} power (yes, this is where Google gets its name). What are some other examples of numbers with special names and their scientific notation equivalents? (for example, a billion is 10^{9})

   a googolplex is $10^{10^{100}}$
   trillion is 10^{12}
   quadrillion is 10^{15}
   quintillion 10^{18}
   sextillion 10^{21}
   septillion 10^{24}
   & so on

7. Look at the prefixes for the metric system (for instance, take meters as the base unit). Write the meaning of each prefix in scientific notation. (You should list at least a dozen such prefixes. You may use the Internet to find the complete list.)

tera - 1×10^{12}
giga - 1×10^{9}
mega - 1×10^{6}
kilo - 1×10^{3}
hecto - 1×10^{2}
deca - 1×10^{1}
meter 1×10^{0}
deci - 1×10^{-1}
Centi - 1×10^{-2}
milli - 1×10^{-3}
micro - 1×10^{-6}
nano - 1×10^{-9}
pico - 1×10^{-12}
femto - 1×10^{-15}