

B. Using Double Units as Conversion Factors

Remember to put the number and the first unit in the numerator and put the second unit, with value “1,” into the denominator, as above. **Show all steps** needed to convert from starting unit to ending unit. Be sure to use the reciprocal of the conversion factor when needed. Every number must have units and you must use the proper number of sig figs in your answer. Remember, conversion factors do not limit your sig figs.

- 5) In problem #1 you found that milk in Denmark costs 5.74 DKK/L. If the average Danish family uses 208 L of milk each year, how much do they spend, in DKK, on milk in one year?
- 6) The speed of light in a vacuum is 2.998×10^8 m/s. The average distance from the sun to the earth is 1.496×10^8 km. How much time, in minutes, does light take to travel this distance? (Hint: you must convert km to m first.)
- 7) Gold has a density of 19.31 g/cm^3 . An explorer finds a large, pure gold statue and determines its mass to be 11.6 kg (convert kg to g first). What is the volume, in cm^3 , of this statue? *What is its volume in m^3 ? (Remember to cube the conversion factor from cm \rightarrow m to get the conversion from $\text{cm}^3 \rightarrow \text{m}^3$.)
- 8) *The average neon (Ne) atom has a mass of 20.18 atomic mass units/atom (atomic mass unit = amu). There are 1.661×10^{-24} g/amu. If the typical Ne light holds 1.00×10^{15} Ne atoms, what mass of neon, in kg, is in the Ne light? (Note: there are 2 double units in this problem.)

Answers: 1) 5.74 DKK/L; 2) 2.965×10^4 km/day; 3) 3.394×10^{-6} pt/ml; 4) $0.42 \text{ } \mu\text{g/mm}^3$; 5) 1190 DKK; 6) 8.317 min; 7) 601 cm^3 , $6.01 \times 10^{-4} \text{ m}^3$; 8) 3.35×10^{-11} kg