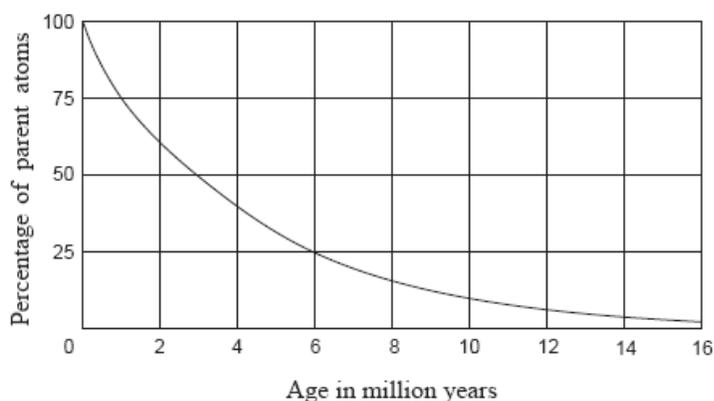


GEOLOGY 12
ABSOLUTE DATING WORKSHEET

Refer to pp 84-88 of the text as well as your notes to answer the following questions.

1.
 - a) Define radioisotope (radioactive isotope).
 - b) What causes some isotopes to be unstable?
 - c) Explain how a carbon-14 atom decays into a nitrogen-14 atom.
 - d) Why won't a carbon-12 isotope decay in the same way?
2.
 - a) Explain the term half-life.
 - b) Why is the half-life of a radioisotope useful in determining the age of a material?
3. Use the Figure 4.19 graph on page 86 of the text to determine the age of a sample, where:
 - a) 12.5% is left of the unstable parent isotope, which has a 1/2-life of 500 000 years.
 - b) the unstable parent isotope has a 1/2-life of 37 000 years and the daughter-parent ratio is 31:1.

4. Examine the graph to the right, representing a radioactive substance.



- a) What is the approximate 1/2-life of the substance?
 - b) About how old is a rock sample that contains about 6% of original parent material?
 - c) About how old would a different rock sample be if it contained a daughter-parent ratio of 7:1?
 - d) About how old would a third sample be if it was found to contain 75% daughter product (compared to the total amount of original parent product)?
 - e) If a rock sample originally contained 20 grams of the parent isotope, how much parent and daughter product would be found in the sample after 10 million years?
5.
 - a) Explain why igneous rock formations such as lava flows and dikes are most useful for radiometric dating.
 - b) Why are sedimentary rocks not useful in radiometric dating?
6. Examine Table 4.1 on p 87.
 - a) Why isn't carbon-14 dating useful in finding the age of old rocks?
 - b) Which dating methods would be considered useful in confirming the age of the following:
 - a 7.5 million year old lava flow
 - a 340 million year old piece of granite containing biotite and potassium feldspar
 - a piece of wood from a 12 300 year old dwelling
7.
 - a) What two conditions must exist for radiometric dating to be accurate?
 - b) What factors can alter these conditions and cause inaccuracies in the radiometric dating process?

8. For the diagram below, give an age limit for sedimentary layers X and Y, based on the radiometric ages for the igneous intrusions shown.

