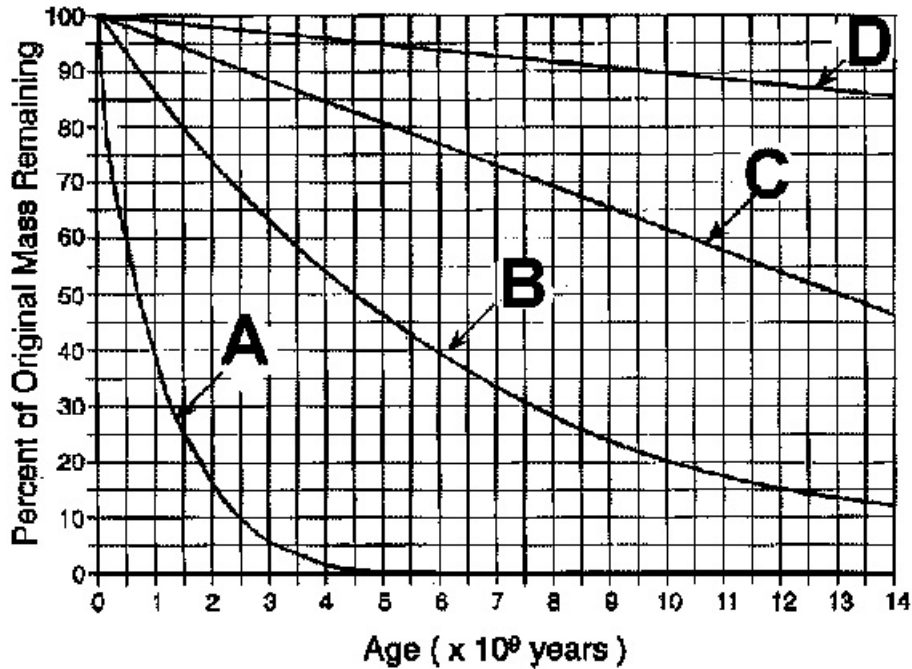


Absolute Dating Problems Worksheet

Base your answers to questions 1 through 5 on the diagram below showing the decay curves for radioactive isotopes A, B, C, and D. Note.0 that 10^9 is one billion years. For example, an age of 2×10^9 years is equivalent to 2 billion years (2,000,000 years).



- Which of the four elements has a half-life of 4.5×10^9 years? _____
- Which element has the longest half-life? _____
- What is the half-life of element C? _____ years
- Which element represents Uranium-238? _____
- Which elements could be used to date rocks formed on Earth? _____
- The parent to daughter ratio is 1:3 after 1.5×10^9 years for this element. _____
- A small sample of granite is taken from a boulder. Both the boulder and the small sample are found to have the same age, based on the decay of Uranium-238. Why isn't the size of a sample a factor in determining its age? _____
- A rock is dated using the Potassium-Argon method. If it was discovered that some of the Argon daughter isotope had been lost from the mineral crystals, the calculated age of the rock would be
 - too old
 - too young
 - unaffected

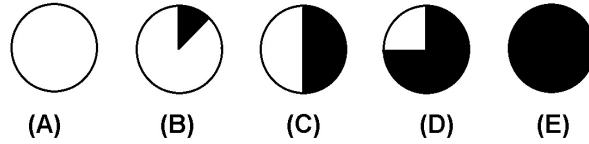
Ans. _____ : Explain the rationale for your answer.

Over

9. An igneous rock that melted during a volcanic eruption was mixture of many minerals. These included mica that contained Potassium-40 and Argon-40 in the ratio of 1:3. The magma eventually cooled and solidified into an igneous rock 1.3×10^9 years ago.

Which of the circles shown below shows the correct shading of the percentage ^{40}K compared to ^{40}Ar found in the mica crystals of the igneous rock at the time it solidified 1.3×10^9 years ago. The darkened portion represents the daughter isotope, ^{40}Ar .

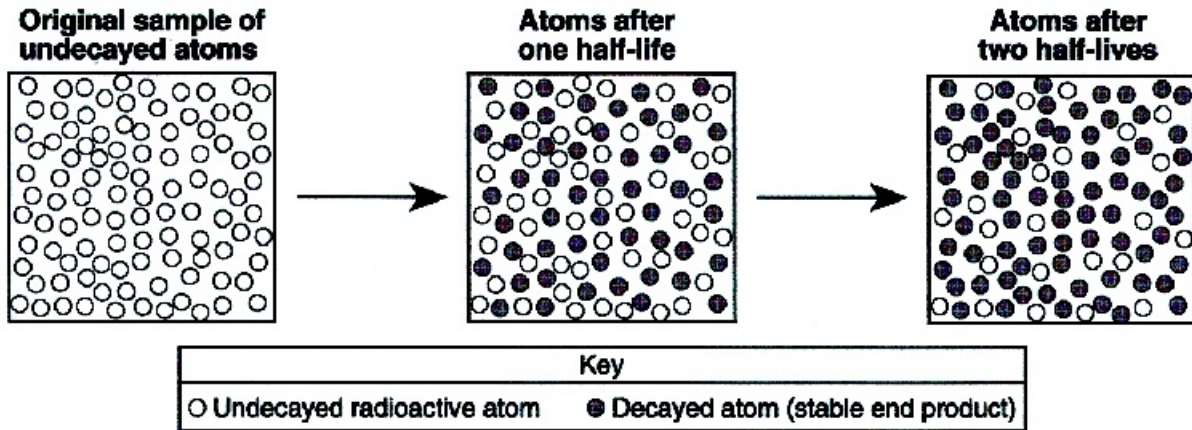
Ans. _____



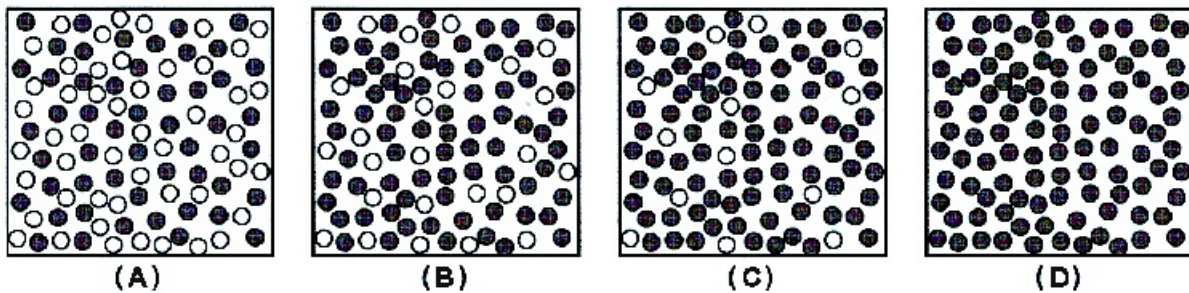
10. If the amount of the parent isotope in the original sample of a rock had been 48 grams, about how much would have been left after three half-lives?

Ans. _____ grams

11. The models below represent the decay of radioactive atoms to stable atoms after their first and second half-lives.



Which lettered diagram shows the model that best represents the number of undecayed and decayed atoms after three half-lives.



Ans. _____