

Using Exp and Log Functions

SCIENCE The half-life of a radioactive substance is the time it takes for half of the atoms of the substance to disintegrate. The half-life of Carbon-14 is 5730 years. Determine the value of k and the equation of decay for Carbon-14.

SCIENCE A paleontologist examining the bones of a prehistoric animal estimates that they contain 2% as much Carbon-14 as they would have contained when the animal was alive.

a. How long ago did the animal live?

1. **PALEONTOLOGY** The half-life of Potassium-40 is about 1.25 billion years.

a. Determine the value of k and the equation of decay for Potassium-40.

b. A specimen currently contains 36 milligrams of Potassium-40. How long will it take the specimen to decay to only 15 milligrams of Potassium-40? **1,578,843,530 yr**

c. How many milligrams of Potassium-40 will be left after 300 million years?

d. How long will it take Potassium-40 to decay to one eighth of its original amount? **2.751**

7 PALEONTOLOGY A paleontologist finds a human bone and determines that the Carbon-14 found in the bone is 85% of that found in living bone tissue. How old is the bone? **about 1354 yr old**