Radioactive decay

The half life of radioactive radon gas is 3.8 days. What is the rate constant for the radioactive decay of radon in s^{-1}?

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The first order rate constant for the decay of radioactive americium-241 is 5.08×10^{-11} s^{-1}. What is its half life in years?

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Step 1. Convert years to seconds.

1 day = (365 days)(86400 seconds/day)

$= 3.15 \times 10^{7}$ sec

Step 2. use the definition of half life.

$\tau_{1/2} = \ln(2)/k = 0.697/\ 5.08 \times 10^{-11}\ s^{-1}$

$= 1.37 \times 10^{10}$ s = 433 years