

Name: \_\_\_\_\_ Per \_\_\_\_\_

**Half-life**

*Practice Sheet #43*

1. In your own words, define half-life.
2. How much of a 100 gram sample of gold-198 is left after 8.10 days if the half-life is 2.70 days?
3. A 50.0 gram sample of polonium-218 decays to 12.5 grams in 9.0 minutes. What is the half-life of polonium-218?
4. The half-life of plutonium-239 is 24110 years. If there are 2.0 grams of a sample left after 48220 years, how many grams were in the original sample?
5. A radiation leak releases 200.0 grams of uranium-238. If uranium-238 has a half-life of  $4.460 \times 10^9$  years, how long will it take for the mass of the sample to decrease to one eighth of the original amount?
6. Hydrogen-3 has a half-life of 12.32 years.
  - a. How long will it take for a 512 mg sample to decay to 16.0 mg?

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- b. How many grams of a 240.0 gram sample would be left after 98.56 years?
7. There are 4.00 grams of iodine-131 left after 40.35 days. If the half-life is 8.07 days, how many grams were in the original sample?
8. The half-life of radon-222 is 3.82 days. How long would it take for a sample to decrease to 3.125 % of the original mass?
9. A sample of thorium-227 decays to one eighth of its original mass in 56.16 days. What is the half-life of thorium-227?