Half-life Calculations WS #2

1) The half-life of Zn-71 is 2.4 minutes. If one had 100.0 grams at the beginning, how many grams would be left after 7.2 minutes has elapsed?

2) Under the same circumstances as above, but you started with 18 grams of Zn-71, how grams would be left?

3) Os-182 has a half-life of 21.5 years. How many grams of a 10 gram sample would have decayed after exactly 3 half lives?

4) U-238 has a half-life of 4.46 billion years. How much U-238 was present initially if 2 grams remains after 13.4 billion years?

5) How much U-238 should be present in a sample that is only 2 billion years old if 4 grams was present initially?

6) An isotope of cesium (cesium-137) has a half life of 30 years. If 1.0 g of cesium-137 disintegrates over a period of 90 years, how many g of cesium-137 would remain?

7) Actinium-226 has a half life of 29 hours. If 100 mg of actinium-226 disintegrates over a period of 58 hours, how many mg of actinium-226 will remain?

8) The half life of isotope X is 2 years. How many years would it take for a 4 mg sample of X to decay and have only 0.5 mg of it remain? (*Hint – think about how many half lives would have to go by – then multiply by how long each half life is. It will be a whole number!)

9) Selenium-83 has a half life of 25 minutes. How many minutes would it take for a 10 mg sample to decay and only have 1.25 mg of it remain? (Same hint as #8)

10) The half life of Po-218 is three minutes. How much of a 2 gram sample remains after 15 minutes?

11) Suppose you wanted to buy some of this isotope in question #10, and it required half an hour for it to reach you. How much should you order if you need to use 0.10 grams of this material (0.10 is the amount you need to end with)?