Geology 101

Skinner Name

Radiometric Dating

Using the table and graph provided, please answer the following questions.

Number of half-lives elapsed	Fraction remaining	Percentage remaining	
0	1/1	100	
1	1/2	50	
2	1/4	25	
3	1/8	12	.5
4	1/16	6	.25
5	1/32	3	.125
6	1/64	1	.563
7	1/128	0	.781
...	...	...	
n	$1 / 2^n$	$100(1 / 2^n)$	

1. 1.Approximately what percentage of parent isotopes remains after 2 half-lives have passed?

25%

2. 2.If a rock initially contained 10 milligrams of a radioactive parent when it first crystallized, how much remains after 4 half-lives?

.625 millagrams

3. 3.What % parent remains after 10 half-lives?

.097%

4. 4.If a mineral contains 1.56% of its original parent isotopes, how many half-lives have passed?

6 half lives

5. 5.Approximately what percentage of parent isotopes remains after 0.5 half-lifes have passed?

75%

6. 6.How many half-lifes must pass before only 10 % of the original parent isotopes remain?

A little over 3

7. 7.Assume a parent isotope has a half-life of 100 million years, how old is a sample that contains 15 % of its original parent isotopes?

About 12.5 million years

8. 8.Assuming a parent isotope with a half-life = 4.5 billion years, what percentage of the original parents remains after 6.75 billion years have passed?

The half-life of U-235 decaying to Pb-207 is 713 million years. Note that this half-life can be obtained from the graph at the point where the decay and growth
curves cross.
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1. U-235 to Pb-207 = 713million years
2. RB-87 to Sr87 =
3. U-238 to Pb 206 =
4. C-14 to N-14 =

Hints
Question #5, % remaining = 100(1/2^n) where n = # of half lives or 0.5
Question #6, 10%=100(1/2^n), 0.1=1/2^n, Log10/Log2=n
Question #7, 15%=100(1/2^n), (Log(100/15))/Log2=n
Question #8, n=6.75/4.5, 100(1/2^n)