Name _____ Date _____ Class _____

REVIEW

7 SECTION 7.1

What Is Radioactivity?

1. **Match** the type of nuclear radiation on the left with the correct description on the right.

a. beta particles	**A.** helium-4 nuclei
b. neutron emission	**B.** high-energy electromagnetic radiation emitted by a nucleus
c. alpha particles	**C.** electrons emitted by neutrons decaying in an unstable nucleus
d. gamma rays	**D.** release of high-energy neutrons

2. **Determine** the amount of time it takes for three-fourths of a radioactive sample of an isotope of bromine to decay. The half-life of the isotope is 16.5 hours.

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3. **Complete** the following radioactive decay equations by identifying the isotope X. Indicate whether alpha or beta decay occurs.

a. $^{214}_{82}\text{Pb} \rightarrow {}^{A}_{Z}\text{X} + {}^{0}_{-1}\text{e}$ _____

b. $^{214}_{83}\text{Bi} \rightarrow {}^{A}_{Z}\text{X} + {}^{0}_{-1}\text{e}$ _____

c. $^{214}_{84}\text{Po} \rightarrow {}^{A}_{Z}\text{X} + {}^{4}_{2}\text{He}$ _____

4. **Explain** how it is possible that negatively charged beta particles are emitted from a positively charged nucleus during nuclear decay.

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5. **Determine** the half-life of a radioactive substance that has changed through radioactive decay. After 40 days, the original substance left is one-sixteenth of the original amount.

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6. **Identify** which of the following is true for gamma ray emission.

a. The atomic number increases but the atomic mass stays the same.
b. Both the atomic number and the atomic mass remain the same.
c. The atomic number decreases and the atomic mass increases.
d. The atomic number stays the same and the atomic mass decreases.

7. **Predict** the change in the atomic number of an atom after beta decay.

a. atomic number increases by 1
b. atomic number decreases by 2
c. atomic number decreases by 1
d. atomic number stays the same