Radioactive Decay Worksheet #2

Isotopes
1. For atoms of the two different isotopes Lithium-6 and Lithium-7...
   a. ...they must have the same number of what type of subatomic particle?
   
   b. ...they must have different numbers of what type of subatomic particle?

2. For each of the following isotopes, write in any missing information about that particular isotope.

<table>
<thead>
<tr>
<th>Name</th>
<th>Oxygen-15</th>
<th>$^{58}_{28}$Ni</th>
<th>Zirconium-</th>
<th>Argon-</th>
<th>_________-</th>
<th>_________-</th>
</tr>
</thead>
<tbody>
<tr>
<td># of protons</td>
<td></td>
<td>50</td>
<td></td>
<td>9</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td># of neutrons</td>
<td></td>
<td>22</td>
<td></td>
<td>10</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

3. Potassium (K) has three naturally-occurring isotopes, Potassium-39, Potassium-40, and Potassium-41. Using a periodic table, which isotope do you think is the most abundant in nature?

What leads you to this conclusion?

Decay Reactions
Fill in the blank in each of the following decay reactions with the correct decay particle or decayed nucleus that will balance the decay reaction, and also state whether it is alpha or beta decay.

4. $^{214}_{84}$Po$\rightarrow_{2}^{4}$He + ________

5. $^{218}_{85}$At$\rightarrow_{-1}^{0}$e + ________

6. $^{239}_{94}$Pu$\rightarrow$________ + $^{235}_{92}$U

7. ________$\rightarrow_{-1}^{0}$e + $^{211}_{83}$Bi

8. Write out the decay reaction for a nucleus of Lead-210 decaying by alpha decay.
The Decay Series of Uranium

Below is the decay series for a Uranium-238 nucleus, showing all of the steps of decay that occur before it finally reaches a stable state. Fill in all blanks of either the type of decay that occurs to get from one step to another, or with the name of the isotope produced at a certain step.