

SAMPLE PROBLEM C

For more help, go to the *Math Tutor* at the end of Chapter 5.

- a. Write both the complete electron-configuration notation and the noble-gas notation for a rubidium atom.
- b. Identify the elements in the second, third, and fourth periods that have the same number of highest-energy-level electrons as rubidium.

SOLUTION

- a. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 5s^1$, [Kr] $5s^1$
- b. Rubidium has one electron in its highest energy level (the fifth). The elements with the same outermost configuration are, in the second period, lithium, Li; in the third period, sodium, Na; and in the fourth period, potassium, K.

PRACTICE

Answers in Appendix E

1. a. Write both the complete electron-configuration notation and the noble-gas notation for a barium atom.
b. Identify the elements in the second, third, fourth, and fifth periods that have the same number of highest-energy-level electrons as barium.
2. a. Write the noble-gas notation for a gold atom.
b. Identify the elements in the sixth period that have one unpaired electron in their $6s$ sublevel.

extension

Go to **go.hrw.com** for more practice problems that deal with electron configurations.



Keyword: HC6ARRX

SECTION REVIEW

1. a. What is an atom's electron configuration?
b. What three principles guide the electron configuration of an atom?
2. What three methods are used to represent the arrangement of electrons in atoms?
3. What is an octet of electrons? Which elements contain an octet of electrons?
4. Write the complete electron-configuration notation, the noble-gas notation, and the orbital notation for the following elements:
a. carbon b. neon c. sulfur
5. Identify the elements having the following electron configurations:
a. $1s^2 2s^2 2p^6 3s^2 3p^3$
b. [Ar] $4s^1$
c. contains four electrons in its third and outer main energy level
d. contains one set of paired and three unpaired electrons in its fourth and outer main energy level

Critical Thinking

6. **RELATING IDEAS** Write the electron configuration for the third-period elements Al, Si, P, S, and Cl. Is there a relationship between the group number of each element and the number of electrons in the outermost energy level?