Chapter 5 Review Answer Key

Assignments:

- Chapter Review questions 1-25 on pages 183-184
- Written Assessment questions 26-29 on page 184
- Focus on Graphing questions 32-37 on pages 185

Chapter Review Assignment

1. An ion is a charged element - it has either lost or gained electrons.
2. A metal must lose an electron (positive charge) to become a cation.
3. A nonmetal element must gain an electron (negative charge) to form an anion.
4. The eight electrons fill the s and p orbitals like the very stable noble gases.
5. The lattice energy must be greater than the energy needed to form the crystal otherwise the bond would not form or hold.
6. The parenthesis show that the polyatomic ion is not separable - it is a charged group.
7. As has 5 valence electrons. As^{-3}
8. Student answers may vary but should discuss the properties listed on pages 164 - 165 in teh textbook.
9. The octet rule helps predict if a cation or anion will be formed and also how much of a charge an ion will likely end up with.
10. The Group 17 elements are so reactive because they need to gain only one electron to fill the octet.
11. The two electrons fill the 1s orbital.
12. A metal must lose an electron (positive charge) to become a cation and a nonmetal element must gain an electron (negative charge) to form an anion.
13. The top right diagram as the K is likely to lose an electron to fill the octet.
14. The melting points and boiling points of ionic compounds tends to be high due to the lattice and crystal energies that need to be overcome.
15. The lattice energy "holds" the salt together.
16. Both K and Mg will form cations and the positive charges repel one another.
17. Chlorite has two oxygens bonded to the cholrine while chlorate has three oxygens.
18. a. sodium(+1) nitrate(-1) b. potassium(+1) sulfite(-2)
    c. ammonium(+1) chromate(-2) d. aluminum(+3) sulfate(-2)
19. a. copper (II) phosphate b. iron (III) nitrate
    c. copper (I) oxide d. copper (II) oxide
20. a. Li_2SO_4 b. $Sr(NO_3)_2$ c. $NH_4C_2H_3O_2$ d. $Ti_2(SO_4)_3$

21.

Element	Ion	Name of ion
Barium	Ba^{2+}	**barium**
Chlorine	**Cl^{-}**	chloride
Chromium	Cr^{3+}	**chromium**
Fluorine	F^{-}	**fluoride**
Manganese	**Mn^{2+}**	manganese(II)
Oxygen	**O^{-2}**	oxide

22. a. peroxide b. chromate c. ammonium d. carbonate

23. a

Atom	Ion	Noble-gas configuration
S	S^{-2}	[Ar]
Be	Be^{+2}	[He]
I	I^{-}	[Xe]
Rb	Rb^{+}	[Kr]
O	O^{-2}	[Ne]
Sr	Sr^{-2}	[Kr]
F	F^{-}	[Ne]

24. a. CN^{-} b. SO_4^{2-} c. NO_2^{-} d. MnO_4^{-}

25. a. 3 b. 1 c. 4 d. 7

26. The metals form cations that then bond with other ions to for the ores.

27. The element's identity is dictated by the number of protons in the nucleus.

28. Group 18 elements satisfy the octet rule and therefore do not form ions.

29. Compound A is likely to be ionic as it has higher boiling and melting points.

30. skip

31. skip

32. There is an increase in potential energy.

33. There is a decrease in potential energy.

34. The crystals are forming.
35. Na + energy --> $Na^+ + e^-$
36. points D to F
37.