KEY to online problem set 4

1. What are the three colligative properties?

a. Decrease in vapor pressure of a solvent

b. Boiling Point Elevation of a solvent

c. Freezing Point Depression

2. Which has the higher boiling point: Explain each choice. (Reminder-the more ions -the more roadblocks for the solvent)

a. seawater or saltwater (choose and then explain for a-c)

Sea water because everything flows into the ocean including the salt so it has the most ions or roadblocks in solution.

b. 1.0 m KNO3 or 1.5 m KNO3

1.5 m KNO3 because it has more ions involved which create more of a roadblock when bringing to a boil

c. .100 m KCl or .100 m MgCl2

.100m MgCl2 will break apart into more ions which creates a bigger roadblock when trying to boil.

3. In old fashioned ice cream makers, NaCl is added to ice to help change the mixture into a solid. What is the purpose of the NaCl?

NaCl is broken up into two parts because it is ionic. The ions are needed to change the freezing point of the ice. The water pushs the ions out of the way, this take energy, and so the temp. of the ice falls. The purpose of the salt is to lower the freezing point of the ice making it colder. That helps freeze the ice cream.