Assignment on problem solving:

A. Write a lesson plan which begins with an interesting problem to solve, then leads naturally into some topic in an algebra or geometry class.

B. Work on a solution to three (3) of these.

For one of those three do the following:

1. Give a complete description of your process, including the four steps of problem solving and a list of strategies you employed to solve it.
2. Are there alternate strategies which might work?
3. Write a similar problem (with solutions) which might appeal to 7th graders.
4. Tell how you think they might approach the problem.

Problems:

I. There are two doors, one red and one blue. Each has a guard standing in front of it. One of the doors leads to the castle, and one leads to certain doom. One of the guards always tells the truth and one of them always lies. Blue door guard says that red always lies, but Red door guard claims that he tells the truth.

When asked what the other guard would say, Red door guard replies that the Blue door guard would say that the Red door leads to the castle. If you want to avoid certain doom, which door should you choose?

II. Starting at the top and ending at the bottom how many different routes can you take to spell ABRACADABRA moving only down in this array?

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A  B  B
R  R  R
A  A  A  A
C  C  C  C
A  A  A  A  A  A
D  D  D  D  D  D
A  A  A  A  A  A  A  A
B  B  B  B  B  B  B
R  R  R  R  R  R  R  R
A  A  A  A  A  A  A  A  A  A  A
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III. 

There were 1000 people at the carnival.

574 had their faces painted, 525 rode the carousel and 527 played on the midway.

Thirty-five did none of those things and 100 did all three.

If 276 painted faces rode the carousel and 122 unpainted faces played the midway and rode the carousel, then how many only played on the midway and how many painted faces did neither of the other activities?

IV. My pet rabbit, Cotton can hop up one step at a time or two steps at a time. The stairs in my house have ten steps. How many different ways can Cotton get up the stairs?

V. A farmer has pigs and chickens. She counted 140 eyes and 200 legs. How many of each are there?

C. Read the article “Fostering Mathematical Thinking and Problem Solving”.

Verify that your lesson plan has included ideas from the article.

D. For the class in two weeks, find multiple ways to represent and solve this set of simultaneous equations, including using manipulatives and word problems.

   \[3x + y = 9\]
   \[x + 2y = 8\]

E. Next week we will meet at the Union Building (Saltair room) at precisely 4 to hear Dr. Moses. After the panel discussion, we will go back to the classroom for discussion.