Geometry Honors Week 5 HW#1, due Friday 9/9
Using Visual, Inductive, and Deductive Reasoning

1. Midway through a 2000-meter race, a photo is taken of five runners. It shows Meg 20 meters behind Edith. Edith is 50 meters ahead of Wanda, who is 20 meters behind Olivia. Olivia is 40 meters behind Nadine. Who is ahead? In your diagram, use *M* for Meg, *E* for Edith, and so on.

2.

3. Look at the pattern in these pairs of equations. Decide if the conjecture is true. If it is true, explain why. If it is not true, find a counterexample and explain why it is not true.

$$12^2 = 144 \quad \text{and} \quad 21^2 = 441$$
$$13^2 = 169 \quad \text{and} \quad 31^2 = 961$$
$$103^2 = 10609 \quad \text{and} \quad 301^2 = 90601$$
$$112^2 = 12544 \quad \text{and} \quad 211^2 = 44521$$

Conjecture: If two numbers have the same digits in reverse order, then the squares of those numbers will have identical digits, but in reverse order.

4. When you use _____ reasoning, you are generalizing (making a conjecture) from careful observation that something is probably true. When you use _____ reasoning, you are establishing that if a set of properties is accepted as true, something else must be true.

5. ∠*A* and ∠*B* are complementary. *m∠A* = 25°. What is *m∠B*? What type(s) of reasoning do you use (visual, inductive or deductive), when solving this problem?

6. *Puzzling Patterns*

   These patterns are "different." Your task is to find the next term.

   1. 18, 46, 94, 63, 52, 61, _?_

   2. O, T, T, F, F, S, S, E, N, _?_

   3. 1, 4, 3, 16, 5, 36, 7, _?_

   4. 4, 8, 61, 221, 244, 884, _?_

   5. 6, 8, 5, 10, 3, 14, 1, _?_

   6. B, 0, C, 2, D, 0, E, 3, F, 3, G, _?_

   7. 2, 3, 6, 1, 8, 6, 8, 4, 8, 4, 8, 3, 2, 3, 2, 3, ?

   8. A E F H I K L M N T V W

   B C D G J O P Q R S U

   Where do the X, Y, and Z go?