3.6 Prove Theorems About Perpendicular Lines

Objective: To find the distance between a point and a line

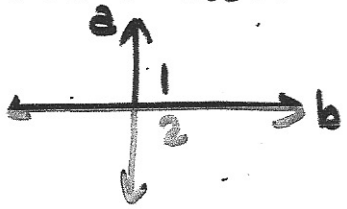
Why? You can apply this to art and construction

Perpendicular Lines Theorems

1- If two lines intersect to form a linear pair of congruent angles, then the lines are $\perp$.

2- If two lines are $\perp$, then they intersect to form four right angles.

Ex 1. In the figure $\angle 1 \cong \angle 2$. What can you conclude about the measure of $\angle 2$



Perpendicular Lines Theorems (continued)

3- If two sides of two adjacent acute angles are $\perp$ then the angles are complementary.

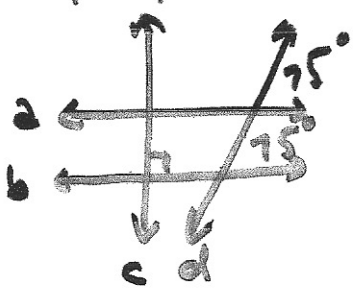
Ex 2. Prove that if $\angle 1$ and $\angle 2$ are complementary, then $BA \perp BC$

More Perpendicular Lines theorems

4- If a transversal is $\perp$ to one of two $\parallel$ lines, then it is $\perp$ to the other.

5- In a plane, if two lines are $\perp$ to the same line, then they are $\parallel$ to each other.

Ex 3. Determine which lines if any, must be perpendicular. Explain your reasoning.



Distance from a point to a line - is the length of the perpendicular segment from the point to the line

Ex 4. What is the distance between the two parallel sides of this table top?