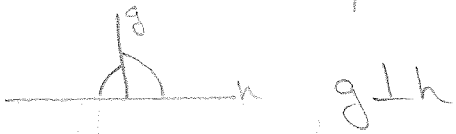
3.2: Proof and ⊥ Lines

Objectives: Write different types of proofs
Prove results about ⊥ lines

Warm-up: State the postulate or theorem that justifies the statement
1) If $3+4=7$, then $7=3+4$
2) If $\angle a$ and $\angle B$ are vertical angles, then $\angle a \cong \angle B$
3) If $2x+5=17$, then $2x=12$

Theorem 3.1
If two lines intersect to form a linear pair of congruent angles, then the lines are ⊥



$g \perp h$

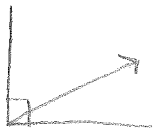
Proof of Theorem 3.1

Given: $\angle 1 \cong \angle 2$, $\angle 1$ and $\angle 2$ are a linear pair
Prove: $g \perp h$

Statement	Reason
1) $\angle 1, \angle 2$ are linear pair	1) given
2) $\angle 1, \angle 2$ are supp	2) linear pair postulate
3) $m\angle 1 + m\angle 2 = 180°$	3) Def of supp. angles
4) $\angle 1 \cong \angle 2$	4) Given
5) $m\angle 1 = m\angle 2$	5) Def of congruent angles
6) $m\angle 1 + m\angle 1 = 180°$	6) Substitution
7) $2m\angle 1 = 180°$	7) Addition
8) $m\angle 1 = 90°$	8) Division
9) $\angle 1$ is a right $\angle$	9) Def of right angle
10) $g \perp h$	10) Def of ⊥ lines

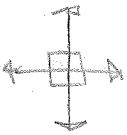
Theorem 3.2

If two sides of two adjacent acute angles are ⊥, then the angles are complementary



Theorem 3.3

If two lines are ⊥, then they intersect to form four right angles



Closure - What happens when two lines intersect to form a linear pair of congruent angles?
- What happens when two sides of adjacent angles are ⊥?
- What happens when two lines are ⊥

Homework 3.2B