Basic Two-Column Proofs
1-2-1 Activity

**Directions:** Complete 1 proof as a group, 2 proofs as a pair, and 1 proof individually.

Remember to look for your basic geometry "Tools":
1. Intersecting lines → Vertical angles & Supplementary Angles
2. Midpoints & Segment Bisectors → the "Rain-Bo Connection"
3. Angle Bisectors
4. Properties of Equality → Transitive & Reflexive

Also...the better you know your definitions & theorems, the better you will be at proofs!
*"One does not speak fluently by looking up every word"*

1. Given: $\overline{AB} \perp \overline{CB}$
    $\angle 2$ is a right angle
Prove: $\angle 1 \cong \angle 3$
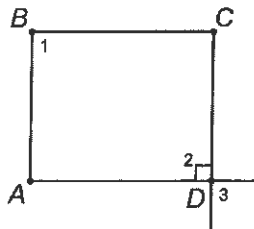
Statements	Reasons
1. $\overline{AB} \perp \overline{CB}$	1. Given
2. $\angle 1$ is a right angle	2. $\perp$ lines form right $\angle$s
3. $\angle 2$ is a right angle	3. Given
4. $\angle 1 \cong \angle 2$	4. all right $\angle$s are $\cong$
5. $\angle 2$ vertical $\angle 3$	5. The non-adj $\angle$s formed by intersecting lines are vertical
6. $\angle 2 \cong \angle 3$	6. vertical $\angle$s are $\cong$
7. $\angle 1 \cong \angle 3$	7. Transitive.

2. Given: $\overline{HP}$ bisects $\overline{EF}$ at P
    $\overline{GE} \cong \overline{EP}$
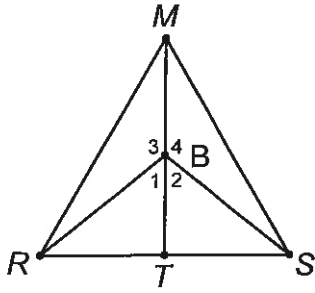Prove: $\overline{GE} \cong \overline{FP}$
Hint: "Rain-Bo" connection
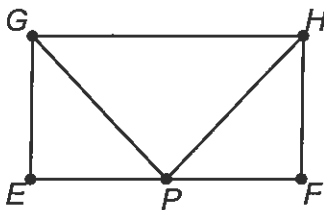
1. $\overline{HP}$ bis $\overline{EF}$ at P	1. given
2. P is midpt $\overline{EF}$	2. seg bis passes thru midpt
3. $\overline{EP} \cong \overline{FP}$	3. midpt ÷ seg into 2 $\cong$ seg.
4. $\overline{GE} \cong \overline{EP}$	4. given
5. $\overline{GE} \cong \overline{FP}$	5. Transitive

3. Given: $\overline{MBT}$
$\overline{MT}$ bisects $\angle RBS$
Prove: $\angle 3 \cong \angle 4$
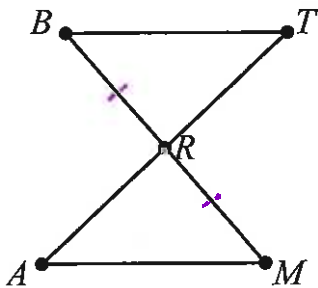*Hint: Identify and use supp angles.*

1. $\overline{MBT}$
2. $\angle 1$ supp $\angle 3$
   $\angle 2$ supp $\angle 4$
3. $\overline{MT}$ bis $\angle RBS$
4. $\angle 1 \cong \angle 2$
5. $\angle 3 \cong \angle 4$

1. Given
2. Adj $\angle$s formed by intersecting lines are supp
3. Given
4. $\angle$ bis $\div$ $\angle$ into 2 $\cong$ $\angle$s
5. Supp to $\cong$ $\angle$s are $\cong$

4. Given: R is the midpoint of $\overline{MB}$.
$\overline{BT} \cong \overline{MR}$

Prove: $\overline{BR} \cong \overline{BT}$
Sorry, no hint here.

1. R is midpt $\overline{MB}$
2. $\overline{BR} \cong \overline{MR}$
3. $\overline{BT} \cong \overline{MR}$
4. $\overline{BR} \cong \overline{BT}$

1. Given
2. midpt $\div$ seg into 2 $\cong$ seg
3. Given
4. Transitive.