Name: _____ **Unit 2:** Logic & Proof

Date: _____ **Bell:** _____ **Homework 8:** Angle Proofs

**** This is a 2-page document! ****

Given each definition or theorem, complete each statement.

1. Definition of Congruence:
   If $\angle D \cong \angle E$, then _____

2. Definition of Complementary Angles:
   If $m\angle 1 + m\angle 2 = 90°$, then _____

3. Definition of Supplementary Angles:
   If $\angle P$ and $\angle Q$ are supplementary angles, then _____

4. Definition of a Right Angle:
   If $m\angle JKL = 90°$, then _____

5. Vertical Angles Theorem:
   If $\angle 3$ and $\angle 4$ are vertical angles, then _____

6. Complement Theorem:
   If $\angle S$ and $\angle T$ form a right angle, then _____

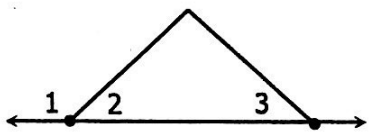
7. Supplement Theorem:
   If $\angle X$ and $\angle Y$ form a linear pair, then _____

8. Congruent Complements Theorem: If $\angle 1$ is complementary to $\angle 2$ and $\angle 2$ is complementary to $\angle 4$, then _____

9. Congruent Complements Theorem: If $\angle J$ is supplementary to $\angle K$ and $\angle J$ is supplementary to $\angle L$, then _____

Complete the proofs below by filling in the missing statements and reasons.

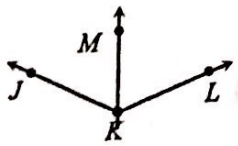
10. **Given:** $\angle 1$ and $\angle 2$ form a linear pair;
    $\angle 1$ and $\angle 3$ are supplementary
    Prove: $\angle 2 \cong \angle 3$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a linear pair	**1.**
2. $\angle 1$ and $\angle 2$ are supplementary	**2.**
3. $m\angle 1 + m\angle 2 = 180°$	**3.**
4. $\angle 1$ and $\angle 3$ are supplementary	**4.**
5. $m\angle 1 + m\angle 3 = 180°$	**5.**
6. $m\angle 1 + m\angle 2 = m\angle 1 + m\angle 3$	**6.**
7. $m\angle 2 = m\angle 3$	**7.**
8. $\angle 2 \cong \angle 3$	**8.**

11. **Given:** $\overrightarrow{KM}$ bisects $\angle JKL$

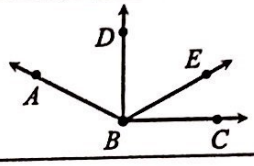
Prove: $m\angle MKL = \frac{1}{2}m\angle JKL$



Statements	Reasons
1. $\overrightarrow{KM}$ bisects $\angle JKL$	1.
2. $m\angle JKM = m\angle MKL$	2.
3. $m\angle JKM + m\angle MKL = m\angle JKL$	3.
4. $m\angle MKL + m\angle MKL = m\angle JKL$	4.
5. $2m\angle MKL = m\angle JKL$	5.
6. $m\angle MKL = \frac{1}{2}m\angle JKL$	6.

12. **Given:** $\overrightarrow{BD} \perp \overrightarrow{BC}$; $\angle ABD \cong \angle DBE$

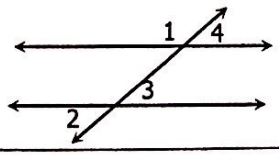
Prove: $\angle ABD$ and $\angle EBC$ are complementary



Statements	Reasons
1. $\overrightarrow{BD} \perp \overrightarrow{BC}$	1.
2. $\angle DBC$ is a right angle	2.
3. $m\angle DBC = 90°$	3.
4. $m\angle DBE + m\angle EBC = m\angle DBC$	4.
5. $m\angle DBE + m\angle EBC = 90°$	5.
6. $\angle ABD \cong \angle DBE$	6.
7. $m\angle ABD = m\angle DBE$	7.
8. $m\angle ABD + m\angle EBC = 90°$	8.
9. $\angle ABD$ and $\angle EBC$ are complementary	9.

13. **Given:** $\angle 1$ and $\angle 4$ form a linear pair;
$\angle 1$ and $\angle 2$ are supplementary

Prove: $\angle 3 \cong \angle 4$



Statements	Reasons
1. $\angle 1$ and $\angle 4$ form a linear pair	1.
2.	2. Supplement Theorem
3.	3. Given
4.	4. Congruent Supplements Theorem
5. $\angle 2 \cong \angle 3$	5.
6.	6. Transitive Property