**GEOMETRIC PROOFS**

1) I can define, identify and illustrate the following terms:

<table>
<thead>
<tr>
<th>Conjecture</th>
<th>Conclusion</th>
<th>Theorem</th>
<th>Negation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inductive</td>
<td>Proof</td>
<td>Prove</td>
<td>Counterexample</td>
</tr>
<tr>
<td>Deductive</td>
<td>Postulate</td>
<td>Given</td>
<td></td>
</tr>
</tbody>
</table>

*Dates, assignments, and quizzes subject to change without advance notice.*

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>3/4</th>
<th>Block Day</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Assumptions &amp; Justifications; Making Conclusions</td>
<td>Fill in the Blank and Plan Proofs</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>10/11</td>
<td>Practice Quiz Review</td>
<td>12</td>
</tr>
</tbody>
</table>

**Wednesday, 10/3 and Thursday, 10/4**

<table>
<thead>
<tr>
<th>Assumptions and Justifications</th>
<th>Making conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can make correct assumptions from a picture, words, or statement.</td>
<td></td>
</tr>
<tr>
<td>I can justify a conclusion with a definition, theorem, or postulate.</td>
<td></td>
</tr>
<tr>
<td>I can make and justify the next logical conclusion from a given statement.</td>
<td></td>
</tr>
</tbody>
</table>

**ASSIGNMENT:** Assumptions, Justifications, and Conclusions Worksheet, pg. 113-114 (4, 7, 8)  
Completed:

**Friday, 10/5**

<table>
<thead>
<tr>
<th>Fill in the Blank and Plan Proofs</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can write a two column proof given a plan.</td>
</tr>
</tbody>
</table>

**ASSIGNMENT:** : pg. 113-114 (4, 7, 8) and Proofs Worksheet #1  
Completed:

**Tuesday, 10/9**

<table>
<thead>
<tr>
<th>Writing Proofs</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can write a two column proof.</td>
</tr>
</tbody>
</table>

**ASSIGNMENT:** Proofs Worksheet #2  
Completed:

**Wednesday, 10/10 and Thursday, 10/11**

<table>
<thead>
<tr>
<th>Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>*I can review for the test in class.</td>
</tr>
</tbody>
</table>

**ASSIGNMENT:** Review WS  
Completed:

**Friday, 10/12**

<table>
<thead>
<tr>
<th>Test 3 – Logic and Proofs</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can demonstrate knowledge skills, and reasoning ability of ALL previously learned material.</td>
</tr>
</tbody>
</table>

**ASSIGNMENT:** Test #3  
Grade:
Assumptions and Justifications

Use page 73 in your book to help complete the notes below…

Things You Can Assume From a Diagram  Things You CAN’T Assume From a Diagram

I. For each picture list the facts you can assume from it.

II. Based on the picture alone, determine if each statement is true or false.

1. $\overline{ET} \parallel \overline{SR}$  
2. $\angle MES$ is a right angle.  
3. $T$ is between $E$ and $H$.  
4. $M$, $O$, $S$, and $H$ are coplanar.  
5. $\overline{MO} \cong \overline{OE}$  
6. $\angle OET \cong \angle TES$  
7. $O$ and $R$ are collinear.  
8. $\angle MTH$ is a right angle.

1. $\angle AEB$ is an acute angle.  
2. $\overline{AE} \parallel \overline{BC}$  
3. $\overline{AB} \perp \overline{BC}$  
4. $AB < AE$  
5. $m\angle ECB = 90^\circ$  
6. $\angle BCE$ and $\angle ECB$ are supplementary.  
7. $\angle AEB$ and $\angle BEC$ are complementary.  
8. $C$ is the midpoint of $\overline{BD}$.  
9. $\angle BCE$ and $\angle ECD$ are a linear pair.  
10. $\angle ABE$ and $\angle EBC$ are complementary.
III. For each statement and its next logical conclusion, tell which definition, postulate, or theorem gives the justification.

1. Given: $AM \cong WU$
   Conclusion: $AM = WU$
   Why: _________________________________

2. Given: E is the midpoint of $BD$
   Conclusion: $BE \cong ED$
   Why: _________________________________

3. Given: A bisects $CT$
   Conclusion: $CA \cong AT$
   Why: _________________________________

4. Given: $CO = OL$
   Conclusion: $CO \cong OL$
   Why: _________________________________

5. Given: $\angle DAY$ and $\angle YAK$ are a linear pair.
   Conclusion: $\angle DAY$ & $\angle YAK$ are supplementary
   Why: _________________________________

6. Given: $\angle TOM$ is the supplement of $\angle SUE$
   Conclusion: $m\angle TOM + m\angle SUE = 180^\circ$
   Why: _________________________________

7. Given: A and B lie in Plane JOG
   Conclusion: A and B are collinear
   Why: _________________________________

8. Given: A is in the interior of $\angle GLD$
   Conclusion: $m\angle GLA + m\angle ALD = m\angle GLD$
   Why: _________________________________

9. Given: $\angle 1$ is the complement to $\angle 3$
    Conclusion: $m\angle 1 + m\angle 3 = 90^\circ$
    Why: _________________________________

10. Given: $\angle HAM$ is vertical to $\angle EAT$
    Conclusion: $\angle HAM \cong \angle EAT$
    Why: _________________________________

11. Given:
    Conclusion: U is the midpoint of $RN$
    Why: _________________________________

12. Given:
    Conclusion: $\angle 8$ and $\angle 9$ are vertical
    Why: _________________________________

13. Given: $m\angle NAT + m\angle WED = 90^\circ$
    Conclusion: $\angle NAT$ & $\angle WED$ are complementary
    Why: _________________________________

14. Given: $FA \cong RM$
    Conclusion: $FA = RM$
    Why: _________________________________

15. Given: $MA = TH$
    Conclusion: $MA \cong TH$
    Why: _________________________________

16. Given: $m\angle AFD + m\angle BAT = 180^\circ$
    Conclusion: $\angle AFD$ & $\angle BAT$ are supplementary
    Why: _________________________________

17. Given:
    Conclusion: $\angle FRO \cong \angle ORG$
    Why: _________________________________

18. Given: $m\angle 2 = m\angle 6$
    Conclusion: $\angle 2 \cong \angle 6$
    Why: _________________________________
Making Conclusions

1. Given: $\overline{TO} \cong \overline{AN}$  
   Conclusion: __________________________  
   Justification: _______________________

2. Given: E is the midpoint of $\overline{BD}$  
   Conclusion: __________________________  
   Justification: _______________________

3. Given: A bisects $\overline{CT}$  
   Conclusion: __________________________  
   Justification: _______________________

4. Given: CO = OL  
   Conclusion: __________________________  
   Justification: _______________________

5. Given: $\angle DAY$ and $\angle YAK$ are a linear pair  
   Conclusion: __________________________  
   Justification: _______________________

6. Given: $\angle TOM$ is the supplement of $\angle SUE$  
   Conclusion: __________________________  
   Justification: _______________________

7. Given:  
   Conclusion: __________________________  
   Justification: _______________________

8. Given:  
   Conclusion: __________________________  
   Justification: _______________________

9. Given:  
   Conclusion: __________________________  
   Justification: _______________________

10. Given:  
   Conclusion: __________________________  
   Justification: _______________________ 

11. Given: $m\angle ABC = m\angle HIJ$  
    Conclusion: __________________________  
    Justification: _______________________

12. Given: $\angle CAT$ and $\angle RAP$ are vertical angles.  
    Conclusion: __________________________  
    Justification: _______________________

13. Given: $\angle SAT \cong \angle ACT$  
    Conclusion: __________________________  
    Justification: _______________________

14. Given: A is in the interior of $\angle GLD$  
    Conclusion: __________________________  
    Justification: _______________________
15. Given: \( FA \cong RM \)
   Conclusion: __________________________
   Justification: __________________________

16. Given: \( \angle HAM \) is vertical to \( \angle EAT \)
   Conclusion: __________________________
   Justification: __________________________

17. Given: __________________________
   Conclusion: __________________________
   Justification: __________________________

18. Given: __________________________
   Conclusion: __________________________
   Justification: __________________________

19. Given: \( m\angle NAT + m\angle WED = 90^\circ \)
   Conclusion: __________________________
   Justification: __________________________

20. Given: \( \overline{UB} \) bisects \( \angle RUY \)
   Conclusion: __________________________
   Justification: __________________________

21. Given: __________________________
   Conclusion: __________________________
   Justification: __________________________

22. Given: __________________________
   Conclusion: __________________________
   Justification: __________________________

23. Given: \( \angle PAI \) and \( \angle IAR \) are a linear pair
   Conclusion: __________________________
   Justification: __________________________

24. Given: \( \angle CAT \) and \( \angle RAP \) are complementary angles.
   Conclusion: __________________________
   Justification: __________________________

25. Given: \( m\angle NAT + m\angle WED = 180^\circ \)
   Conclusion: __________________________
   Justification: __________________________

26. Given: A is between J and M
   Conclusion: __________________________
   Justification: __________________________

“Making Conclusions” Worksheet continues on the next page…
For #27 and 28, a two column proof is given but steps are missing. Fill in the missing steps and rewrite the whole proof correctly.

27. Given: \( \angle 1 \) is supplementary to \( \angle 2 \), \( \angle 3 \) is supplementary to \( \angle 4 \), and \( \angle 2 \equiv \angle 4 \)
Prove: \( \angle 1 \equiv \angle 3 \)

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( \angle 1 &amp; \angle 2 ) are supp. ( \angle 3 &amp; \angle 4 ) are supp.</td>
<td>Given</td>
</tr>
<tr>
<td>2. ( m\angle 1 + m\angle 2 = 180^\circ ) ( \angle 3 + \angle 4 = 180^\circ )</td>
<td>Def. of Supplement.</td>
</tr>
<tr>
<td>3. ( m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4 )</td>
<td>Transitive Prop.</td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6. ( m\angle 1 + m\angle 4 = m\angle 3 + m\angle 4 )</td>
<td>Substitution prop, Steps ___ and ___</td>
</tr>
<tr>
<td>7. ( m\angle 1 \equiv m\angle 3 )</td>
<td>Subtraction prop.</td>
</tr>
<tr>
<td>8. ( \angle 1 \equiv \angle 3 )</td>
<td>Def. of ( \equiv )</td>
</tr>
</tbody>
</table>

28. Given: \( \angle 5 \) is complementary to \( \angle 7 \)
Prove: \( \overline{MI} \perp \overline{IE} \)

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( \angle 5 &amp; \angle 7 ) are comp.</td>
<td>Given</td>
</tr>
<tr>
<td>2. ( m\angle 5 + m\angle 7 = 90^\circ )</td>
<td>Def. of complement.</td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4. ( m\angle MIE = 90^\circ )</td>
<td>Substitution, steps ___ and ___</td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6. ( \overline{MI} \perp \overline{IE} )</td>
<td>Definition of perpendicular</td>
</tr>
</tbody>
</table>
4. Fill in the blanks to complete the two-column proof.
   Given: \( \angle 2 \cong \angle 3 \)
   Prove: \( \angle 1 \) and \( \angle 3 \) are supplementary.
   Proof:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( \angle 2 \cong \angle 3 )</td>
<td>1. Given</td>
</tr>
<tr>
<td>2. ( m\angle 2 = m\angle 3 )</td>
<td>2. a. ____?</td>
</tr>
<tr>
<td>4. ( m\angle 1 + m\angle 2 = 180^\circ )</td>
<td>4. Def. of supp. ( \Delta )</td>
</tr>
</tbody>
</table>
   | 5. \( m\angle 1 + m\angle 3 = 180^\circ \) | 5. c. ____?  
   | 6. d. ____? | 6. Def. of supp. \( \Delta \). |

Fill in the blanks to complete each two-column proof.

7. Given: \( \angle 1 \) and \( \angle 2 \) are supplementary, and \( \angle 3 \) and \( \angle 4 \) are supplementary. \( \angle 2 \cong \angle 3 \)
   Prove: \( \angle 1 \cong \angle 4 \)
   Proof:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( \angle 1 ) and ( \angle 2 ) are supplementary. ( \angle 3 ) and ( \angle 4 ) are supplementary.</td>
<td>1. Given</td>
</tr>
<tr>
<td>2. a. ____?</td>
<td>2. Def. of supp. ( \Delta )</td>
</tr>
<tr>
<td>3. ( m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4 )</td>
<td>3. b. ____?</td>
</tr>
<tr>
<td>4. ( \angle 2 \cong \angle 3 )</td>
<td>4. Given</td>
</tr>
<tr>
<td>5. ( m\angle 2 = m\angle 3 )</td>
<td>5. Def. of ( \cong \Delta )</td>
</tr>
</tbody>
</table>
   | 6. c. ____? | 6. Subtr. Prop. of \( = \)  
   | 7. \( \angle 1 \cong \angle 4 \) | 7. d. ____? |

8. Given: \( \angle BAC \) is a right angle. \( \angle 2 \cong \angle 3 \)
   Prove: \( \angle 1 \) and \( \angle 3 \) are complementary.
   Proof:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( \angle BAC ) is a right angle.</td>
<td>1. Given</td>
</tr>
<tr>
<td>2. ( m\angle BAC = 90^\circ )</td>
<td>2. a. ____?</td>
</tr>
<tr>
<td>3. b. ____?</td>
<td>3. ( \angle ) Add. Post.</td>
</tr>
<tr>
<td>4. ( m\angle 1 + m\angle 2 = 90^\circ )</td>
<td>4. Subst. ( \text{Steps 2, 3} )</td>
</tr>
<tr>
<td>5. ( \angle 2 \cong \angle 3 )</td>
<td>5. Given</td>
</tr>
<tr>
<td>6. c. ____?</td>
<td>6. Def. of ( \cong \Delta )</td>
</tr>
</tbody>
</table>
   | 7. \( m\angle 1 + m\angle 3 = 90^\circ \) | 7. d. ____?  
   | 8. e. ____? | 8. Def. of comp. \( \Delta \) |
Proofs Worksheet #1

On a separate paper, write a two-column proof for each problem 1-5. Follow the plan provided for help.

1. Given: \( \overline{RT} \cong \overline{SU} \)  
   Prove: \( RS = TU \)

   **Plan:** Use the definition of congruent segments to write the given information in terms of lengths. Next use the Segment Addition Postulate to write \( RT \) in terms of \( RS + ST \) and \( SU \) as \( ST + TU \). Substitute those into the given information and use the Subtraction Property of Equality to eliminate \( ST \) and leave \( RS = TU \).

2. Given: \( \angle 5 = 47^\circ \)  
   Prove: \( \angle 6 = 133^\circ \)

   **Plan:** Use the Linear Pair Theorem to show that \( \angle 5 \) and \( \angle 6 \) are supplementary. Then use the definition of supplementary angles to show that their measures add up to \( 180^\circ \). Finally use substitution and then subtraction to arrive at the “Prove” statement.

3. Given: \( AB = BC \)  
   \( BC = BD \)  
   Prove: B is the midpoint of \( \overline{AD} \)

   **Plan:** Write the “Given” information and use the transitive property to show that \( AB = BD \). Then use the definition of congruence to show that the segments are congruent and the definition of midpoint to finish the proof.

4. Given: \( \ell \) bisects \( \overline{MN} \) at \( P \)  
   Prove: \( MP = PN \)

   **Plan:** Use the definition of bisect to show the two smaller segments are congruent. Then use the definition of congruence to show that their lengths are equal.

5. Given: \( \angle 1 \) and \( \angle 2 \) are supplementary;  
   \( \angle 1 \equiv \angle 3 \)  
   Prove: \( \angle 3 \) and \( \angle 2 \) are supplementary

   **Plan:** Use the definition of supplementary angles and congruent angles to write the given information in terms of angle measures. Next use substitution to show that \( m\angle 3 + m\angle 2 = 180^\circ \). Then use the definition of supplementary angles for the conclusion.
1. Given: O is the midpoint of $MN$
   OM = OW
   Prove: OW = ON

2. Given: AB = CD
   Prove: AC = BD

3. Given: $m\angle 1 = 90^\circ$
   Prove: $m\angle 2 = 90^\circ$

4. Given: $\angle 1$ and $\angle 2$ are complementary
   $\angle 3$ and $\angle 2$ are complementary
   Prove: $m\angle 1 = m\angle 3$

5. Given: $m\angle 1 = m\angle 3$
   Prove: $m\angle JOL = m\angle KOM$

6. Given: $m\angle 1 = 90^\circ$
   Prove: $m\angle 2 + 90 = 180$

7. Given: $PR \cong LN$
   Q is the midpoint of $PR$
   M is the midpoint of $LN$
   Prove: PQ = LM

8. Given: $EF \perp EG$
   D is in the interior of $\angle FEG$
   Prove: $\angle FED$ and $\angle DEG$ are complementary

9. Given: $AB \cong CD$
   Prove: $AC \cong BD$

10. Given: $\angle 1$ and $\angle 2$ are supplementary
    $\angle 1 \cong \angle 2$
    Prove: $\angle 1$ and $\angle 2$ are right angles

11. Given: $\angle 1 \cong \angle 2$
    Prove: $\angle 1$ and $\angle 2$ are right angles

12. Given: $\angle 1$ and $\angle 2$ are complementary
    Prove: $\angle 2$ and $\angle 3$ are complementary
13. 

Given: \( m\angle 2 = 2(m\angle 1) \)  
Prove: \( m\angle 1 = 60^\circ \)

14. 

Given: \( \overline{AD} \) bisects \( \angle BAC \)  
\( \angle 1 \equiv \angle 3 \)  
Prove: \( \angle 2 \equiv \angle 3 \)

15. 

Given: \( \angle ABC \) is a right angle  
Prove: \( \angle 1 \) and \( \angle 2 \) are complementary

16. 

Given: \( \overline{CD} \equiv \overline{EF} \)  
\( \overline{CD} \equiv \overline{FG} \)  
Prove: \( F \) is the midpoint of \( \overline{EG} \)

17. 

Given: \( KU = HF \)  
Prove: \( \overline{KH} \equiv \overline{UF} \)

18. 

Given: \( \angle ABD \) and \( \angle CDB \) are right angles  
\( m\angle 2 = m\angle 4 \)  
Prove: \( m\angle 1 = m\angle 3 \)

19. 

Given: \( m\angle ABC = m\angle CBD \)  
Prove: \( \overline{BC} \) is the angle bisector of \( \angle ABD \)

20. 

Given: \( m\angle ABE = m\angle CBE \)  
Prove: \( \angle ABD \) and \( \angle DBE \) are complementary