

**GEOMETRIC PROOFS****1) I can define, identify and illustrate the following terms**

Conjecture	Conclusion	Theorem	Negation
Inductive	Proof	Prove	Counterexample
Deductive	Postulate	Given	

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

Monday	Tuesday	Block Day	Friday
		3/4 Assumptions & Justifications; Making Conclusions  Fill in the Blank Proofs	5  Fill in the Blank and Plan Proofs
8 <b>STUDENT HOLIDAY</b>	9 Writing Proofs	10/11 Practice Quiz <b>Review</b>	12 <b>TEST 4</b>

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

<b>Assumptions and Justifications Making conclusions</b>	
I can make correct assumptions from a picture, words, or statement.	
I can justify a conclusion with a definition, theorem, or postulate.	
I can make and justify the next logical conclusion from a given statement.	
<b>ASSIGNMENT:</b> Assumptions, Justifications, and Conclusions Worksheet, pg. 113-114 (4, 7, 8)	Completed:

**Friday, 10/5**

<b>Fill in the Blank and Plan Proofs</b>	
I can write a two column proof given a plan.	
<b>ASSIGNMENT:</b> : pg. 113-114 (4, 7, 8) and Proofs Worksheet #1	Completed:

**Tuesday, 10/9**

<b>Writing Proofs</b>	
I can write a two column proof.	
<b>ASSIGNMENT:</b> Proofs Worksheet #2	Completed:

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

<b>Review</b>	
*I can review for the test in class.	
<b>ASSIGNMENT:</b> Review WS	Completed:

**Friday, 10/12**

<b>Test 3 – Logic and Proofs</b>	
I can demonstrate knowledge skills, and reasoning ability of ALL previously learned material.	
<b>ASSIGNMENT:</b> Test #3	<b>Grade:</b>



III. For each statement and its next logical conclusion, tell which definition, postulate, or theorem gives the justification.

1. Given:  $\overline{AM} \cong \overline{WU}$   
 Conclusion:  $AM = WU$

Why: \_\_\_\_\_

2. Given: E is the midpoint of  $\overline{BD}$   
 Conclusion:  $\overline{BE} \cong \overline{ED}$

Why: \_\_\_\_\_

3. Given: A bisects  $\overline{CT}$   
 Conclusion:  $\overline{CA} \cong \overline{AT}$

Why: \_\_\_\_\_

4. Given:  $CO = OL$   
 Conclusion:  $\overline{CO} \cong \overline{OL}$

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:  $m\angle GLA + m\angle ALD = m\angle GLD$

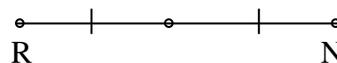
Why: \_\_\_\_\_

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:  $\angle HAM \cong \angle EAT$

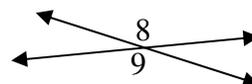
Why: \_\_\_\_\_



11. Given:

Conclusion: U is the midpoint of  $\overline{RN}$

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:  $\overline{FA} \cong \overline{RM}$   
 Conclusion:  $FA = RM$

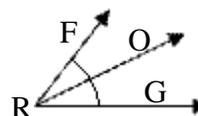
Why: \_\_\_\_\_

15. Given:  $MA = TH$   
 Conclusion:  $\overline{MA} \cong \overline{TH}$

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: \_\_\_\_\_

Name: \_\_\_\_\_

Period: \_\_\_\_\_

### 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

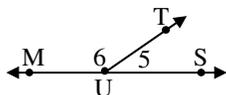
Conclusion: \_\_\_\_\_

Justification: \_\_\_\_\_

6. Given:  $\angle TOM$  is the supplement of  $\angle SUE$

Conclusion: \_\_\_\_\_

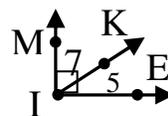
Justification: \_\_\_\_\_



7. Given:

Conclusion: \_\_\_\_\_

Justification: \_\_\_\_\_



8. Given:

Conclusion: \_\_\_\_\_

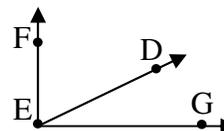
Justification: \_\_\_\_\_



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:  $\overline{FA} \cong \overline{RM}$

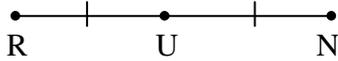
Conclusion: \_\_\_\_\_

Justification: \_\_\_\_\_

16. Given:  $\angle HAM$  is vertical to  $\angle EAT$

Conclusion: \_\_\_\_\_

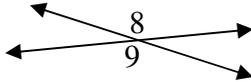
Justification: \_\_\_\_\_



17. Given:

Conclusion: \_\_\_\_\_

Justification: \_\_\_\_\_



18. Given;

Conclusion: \_\_\_\_\_

Justification: \_\_\_\_\_

19. Given:  $m\angle NAT + m\angle WED = 90^\circ$

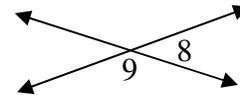
Conclusion: \_\_\_\_\_

Justification: \_\_\_\_\_

20. Given:  $\overline{UB}$  bisects  $\angle RUY$

Conclusion: \_\_\_\_\_

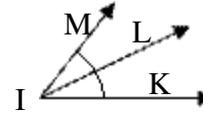
Justification: \_\_\_\_\_



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**.



Given:  $\angle 1$  is supplementary to  $\angle 2$ ,  $\angle 3$  is supplementary to  $\angle 4$ , and  $\angle 2 \cong \angle 4$

Prove:  $\angle 1 \cong \angle 3$

Statements	Reasons
1. $\angle 1$ & $\angle 2$ are supp. $\angle 3$ & $\angle 4$ are supp.	Given
2. $m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 3 + m\angle 4 = 180^\circ$	Def. of Supplement.
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	Transitive Prop.
4.	
5.	
6. $m\angle 1 + m\angle 4 = m\angle 3 + m\angle 4$	Substitution prop, Steps ___ and ___
7. $m\angle 1 \cong m\angle 3$	Subtraction prop.
8. $\angle 1 \cong \angle 3$	Def. of $\cong$



Given:  $\angle 5$  is complementary to  $\angle 7$

Prove:  $\overline{MI} \perp \overline{IE}$

Statements	Reasons
1. $\angle 5$ & $\angle 7$ are comp.	Given
2. $m\angle 5 + m\angle 7 = 90^\circ$	Def. of complement.
3.	
4. $m\angle MIE = 90^\circ$	Substitution, steps ___ and ___
6. $\overline{MI} \perp \overline{IE}$	Definition of perpendicular

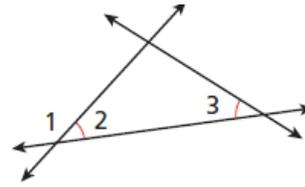
P 113 (4, 7, 8)

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:



Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given
2. $m\angle 2 = m\angle 3$	2. a. ___ ?
3. b. ___ ?	3. Lin. Pair Thm.
4. $m\angle 1 + m\angle 2 = 180^\circ$	4. Def. of supp. $\underline{\sphericalangle}$
5. $m\angle 1 + m\angle 3 = 180^\circ$	5. c. ___ ? <i>Steps 2, 4</i>
6. d. ___ ?	6. Def. of supp. $\underline{\sphericalangle}$

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

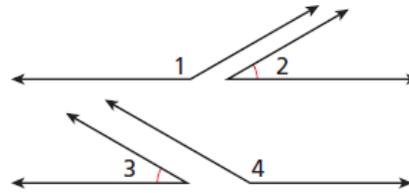
7. Given:  $\angle 1$  and  $\angle 2$  are supplementary, and

$\angle 3$  and  $\angle 4$  are supplementary.

$\angle 2 \cong \angle 3$

Prove:  $\angle 1 \cong \angle 4$

Proof:

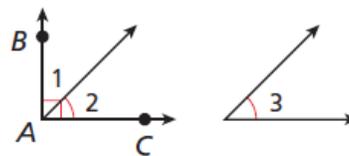


Statements	Reasons
1. $\angle 1$ and $\angle 2$ are supplementary. $\angle 3$ and $\angle 4$ are supplementary.	1. Given
2. a. ___ ?	2. Def. of supp. $\underline{\sphericalangle}$
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	3. b. ___ ?
4. $\angle 2 \cong \angle 3$	4. Given
5. $m\angle 2 = m\angle 3$	5. Def. of $\cong \underline{\sphericalangle}$
6. c. ___ ?	6. Subtr. Prop. of = <i>Steps 3, 5</i>
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:



Statements	Reasons
1. $\angle BAC$ is a right angle.	1. Given
2. $m\angle BAC = 90^\circ$	2. a. ___ ?
3. b. ___ ?	3. $\angle$ Add. Post.
4. $m\angle 1 + m\angle 2 = 90^\circ$	4. Subst. <i>Steps 2, 3</i>
5. $\angle 2 \cong \angle 3$	5. Given
6. c. ___ ?	6. Def. of $\cong \underline{\sphericalangle}$
7. $m\angle 1 + m\angle 3 = 90^\circ$	7. d. ___ ? <i>Steps 4, 6</i>
8. e. ___ ?	8. Def. of comp. $\underline{\sphericalangle}$

### Proofs Worksheet #1

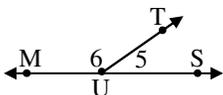
On a separate paper, write a two-column proof for each problem 1-5. Follow the plan provided for help.

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



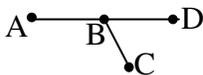
**Plan:** Use the definition of congruent segments to write the given information in terms of lengths. Next use the Segment Addition Postulate to write  $RT$  in terms of  $RS + ST$  and  $SU$  as  $ST + TU$ . Substitute those into the given information and use the Subtraction Property of Equality to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

2. Given:  $m\angle 5 = 47^\circ$   
 Prove:  $m\angle 6 = 133^\circ$



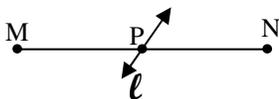
**Plan:** Use the Linear Pair Theorem to show that  $\angle 5$  and  $\angle 6$  are supplementary. Then use the definition of supplementary angles to show that their measures add up to  $180^\circ$ . Finally use substitution and then subtraction to arrive at the “Prove” statement.

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



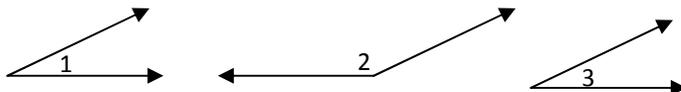
**Plan:** Write the “Given” information and use the transitive property to show that  $AB=BD$ . Then use the definition of congruence to show that the segments are congruent and the definition of midpoint to finish the proof.

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



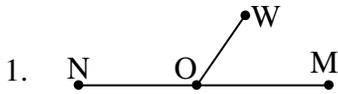
**Plan:** Use the definition of bisect to show the two smaller segments are congruent. Then use the definition of congruence to show that their lengths are equal.

5. Given:  $\angle 1$  and  $\angle 2$  are supplementary;  
 $\angle 1 \cong \angle 3$   
 Prove:  $\angle 3$  and  $\angle 2$  are supplementary

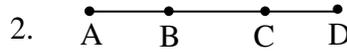


**Plan:** Use the definition of supplementary angles and congruent angles to write the given information in terms of angle measures. Next use substitution to show that  $m\angle 3 + m\angle 2 = 180^\circ$ . Then use the definition of supplementary angles for the conclusion.

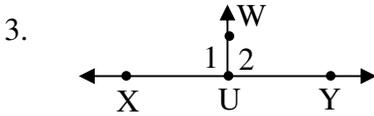
Proofs Worksheet #2



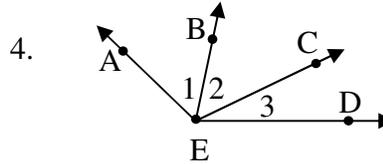
Given: O is the midpoint of  $\overline{MN}$   
 $OM = OW$   
 Prove:  $OW = ON$



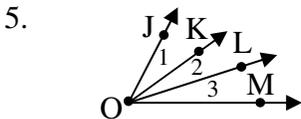
Given:  $AB = CD$   
 Prove:  $AC = BD$



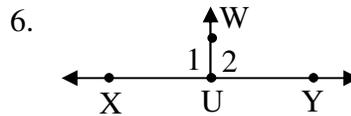
Given:  $m\angle 1 = 90^\circ$   
 Prove:  $m\angle 2 = 90^\circ$



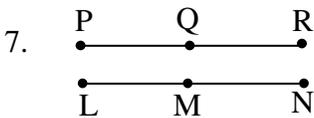
Given:  $\angle 1$  and  $\angle 2$  are complementary  
 $\angle 3$  and  $\angle 2$  are complementary  
 Prove:  $m\angle 1 = m\angle 3$



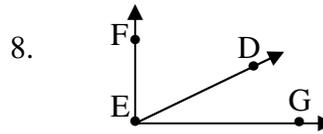
Given:  $m\angle 1 = m\angle 3$   
 Prove:  $m\angle JOL = m\angle KOM$



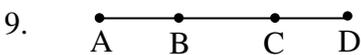
Given:  $m\angle 1 = 90^\circ$   
 Prove:  $m\angle 2 + 90 = 180$



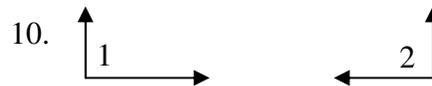
Given:  $\overline{PR} \cong \overline{LN}$   
 Q is the midpoint of  $\overline{PR}$   
 M is the midpoint of  $\overline{LN}$   
 Prove:  $PQ = LM$



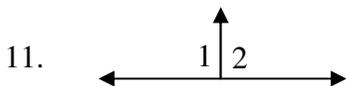
Given:  $\overline{EF} \perp \overline{EG}$   
 D is in the interior of  $\angle FEG$   
 Prove:  $\angle FED$  and  $\angle DEG$  are complementary



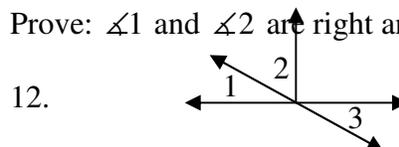
Given:  $\overline{AB} \cong \overline{CD}$   
 Prove:  $\overline{AC} \cong \overline{BD}$



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

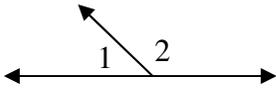


Given:  $\angle 1 \cong \angle 2$   
 Prove:  $\angle 1$  and  $\angle 2$  are right angles



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

13.



Given:  $m\angle 2 = 2(m\angle 1)$

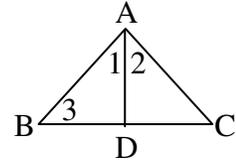
Prove:  $m\angle 1 = 60^\circ$

14.

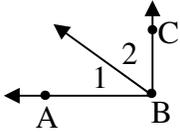
Given:  $\overline{AD}$  bisects  $\angle BAC$

$\angle 1 \cong \angle 3$

Prove:  $\angle 2 \cong \angle 3$



15.



Given:  $\angle ABC$  is a right angle

Prove:  $\angle 1$  and  $\angle 2$  are complementary

16.

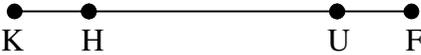


Given:  $\overline{CD} \cong \overline{EF}$

$\overline{CD} \cong \overline{FG}$

Prove: F is the midpoint of  $\overline{EG}$

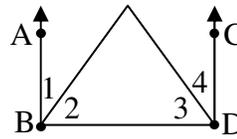
17.



Given:  $KU = HF$

Prove:  $\overline{KH} \cong \overline{UF}$

18.

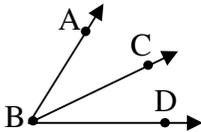


Given:  $\angle ABD$  and  $\angle CDB$  are right angles

$m\angle 2 = m\angle 4$

Prove:  $m\angle 1 = m\angle 3$

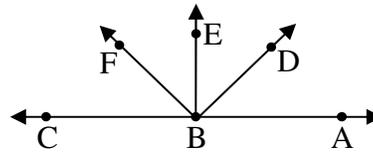
19.



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