

Day 6 - Geometric Proofs Practice

1. In the blanks with the justifications to complete the two-column proof.

A. Given: $\angle 1$ and $\angle 2$ are straight angles.
Prove: $\angle 1 = \angle 2$



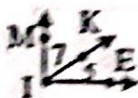
Statements	Reasons
1. $\angle 1$ and $\angle 2$ are straight angles	1. Given
2. $m\angle 1 = 180^\circ, m\angle 2 = 180^\circ$	2. Definition of straight angle
3. $m\angle 1 = m\angle 2$	3. Transitive (1,2) / Substitution
4. $\angle 1 = \angle 2$	4. Def. of $\cong \angle$

B. Given: $\angle 1$ and $\angle 2$ form a linear pair, and $\angle 3$ and $\angle 4$ form a linear pair.
Prove: $\angle 1 + \angle 2 + \angle 3 + \angle 4 = 360^\circ$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a linear pair, and $\angle 3$ and $\angle 4$ form a linear pair.	1. Given
2. $\angle 1$ and $\angle 2$ are supplementary, and $\angle 3$ and $\angle 4$ are supplementary.	2. Definition of Linear Pair
3. $\angle 1 + \angle 2 = 180^\circ$ $\angle 3 + \angle 4 = 180^\circ$	3. Def. of supp. \angle
4. $\angle 1 + \angle 2 + \angle 3 + \angle 4 = 360^\circ$	4. Addition

C. Given: $\angle 5$ is complementary to $\angle 7$
Prove: $\overline{MI} \perp \overline{IE}$

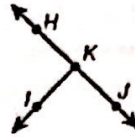


Statements	Reasons
1. $\angle 5$ is complementary to $\angle 7$	1. Given
2. $m\angle 5 + m\angle 7 = 90^\circ$	2. Def. of complementary angles
3. $m\angle 5 + m\angle 7 = m\angle MIE$	3. \angle Add. Post.
4. $m\angle MIE = 90^\circ$	4. Substitution / Transitive (2,3)
5. $\overline{MI} \perp \overline{IE}$	5. Def. of perpendicular

D. Given: $\angle HKJ$ is a straight angle.

\overline{KI} bisects $\angle HKJ$.

Prove: $\angle IKJ$ is a right angle.



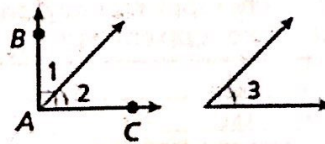
Statements	Reasons
1. $\angle HKJ$ is a straight \angle	1. Given
2. $m\angle HKJ = 180^\circ$	2. Definition of straight angle
3. \overline{KI} bisects $\angle HKJ$	3. Given
4. $\angle IKJ \cong \angle IKH$	4. Definition of bisects
5. $m\angle IKJ = m\angle IKH$	5. $\cong \angle$'s \rightarrow = measures
6. $m\angle HKI + m\angle IKJ = m\angle HKJ$	6. \angle Add. Post.
7. $m\angle IKJ + m\angle IKH = 180^\circ$	7. Substitution / Transitive (2, 6)
8. $m\angle IKJ + m\angle IKJ = 180^\circ$	8. Substitution
9. $2(m\angle IKJ) = 180^\circ$	9. Combine Like Terms
10. $m\angle IKJ = 90^\circ$	10. Division Prop
11. $\angle IKJ$ is a right angle.	11. Definition of Right Angle

E.

Given: $\angle BAC$ is a right angle. $\angle 2 \cong \angle 3$

Prove: $\angle 1$ and $\angle 3$ are complementary.

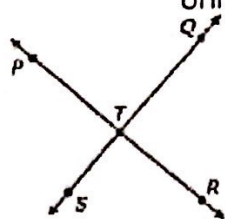
Proof:



Statements	Reasons
1. $\angle BAC$ is a right angle	1. Given
2. $m\angle BAC = 90^\circ$	2. Definition of right angle
3. $m\angle 1 + m\angle 2 = m\angle BAC$	3. \angle Add. Post.
4. $m\angle 1 + m\angle 2 = 90^\circ$	4. Substitution Property
5. $\angle 2 \cong \angle 3$	5. Given
6. $m\angle 2 = m\angle 3$	6. Def. of $\cong \angle$
7. $m\angle 1 + m\angle 3 = 90^\circ$	7. Substitution
8. $\angle 1$ and $\angle 3$ are complementary	8. Def. of comp. \angle

Geometry

F. Given: $\angle QTR \cong \angle PTQ$

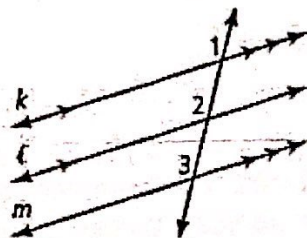


Prove: $\overline{PR} \perp \overline{QS}$

	Statement		Reason
1	$\angle QTR \cong \angle PTQ$ $m\angle QTR = m\angle PTQ$	1	Given $\leftarrow \cong \angle's \rightarrow = \text{measures}$
2	$\angle QTR$ & $\angle PTQ$ are supplementary	2	Linear Pair Theorem
3	$m\angle QTR + m\angle PTQ = 180^\circ$	3	Definition of Supp \angle 's
4	$m\angle PTQ + m\angle PTQ = 180^\circ$	4	Substitution
5	$2(m\angle PTQ) = 180^\circ$	5	Combine Like Terms
6	$m\angle PTQ = 90^\circ$	6	Division Prop
7	$\overline{PR} \perp \overline{QS}$	7	Definition of perpendicular

G. Given: $l \parallel k$ and $m \parallel k$

Prove: $l \parallel m$



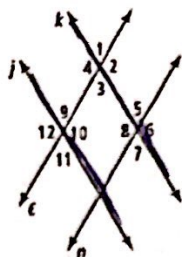
	Statement		Reason
1	$l \parallel k$	1	Given
2	$m \parallel k$	2	Given
3	$\angle 1 \cong \angle 2$	3	Corresponding Angles Theorem
4	$\angle 1 \cong \angle 3$	4	Corresponding Angles Theorem
5	$\angle 2 \cong \angle 3$	5	Transitive Property
6	$k \parallel l$	6	Converse of Corresponding Angles Theorem

Geometry

Unit3: Intro to Proofs

H. Given: $l \parallel n$ and $\angle 12 \cong \angle 8$

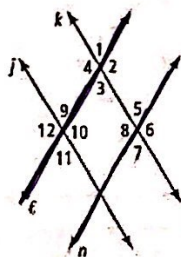
Prove: $j \parallel k$



	Statement		Reason
1	$l \parallel n$	1	Given
2	$\angle 12 \cong \angle 8$	2	Given
3	$\angle 4 \cong \angle 8$	3	Corr. \angle 's are \cong
4	$\angle 12 \cong \angle 4$	4	Substitution / Transitive Prop
5	$j \parallel k$	5	Corr \angle 's are $\cong \rightarrow$ lines are parallel "Converse of Corr \angle 's Thm)

i. Given: $j \parallel k$ and $m\angle 8 + m\angle 9 = 180^\circ$

Prove: $l \parallel n$



	Statement		Reason
1	$j \parallel k$	1	Given
2	$m\angle 8 + m\angle 9 = 180$	2	Given
3	$m\angle 4 \cong m\angle 8$	3	Corr. \angle 's are \cong
4	$m\angle 4 + m\angle 9 = 180$	4	Substitution / Transitive Prop
5	$l \parallel n$	5	Same-side int \angle 's are Supp \rightarrow lines are parallel "Converse of Same-side Int \angle 's Thm"