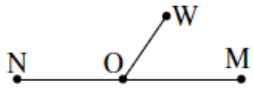
Name: _____ No. _____ Per: _____ Date: _____
Serafino · Geometry M T W R F

2C

Proofs Practice – "Proofs Worksheet #2"

1. Given: O is the midpoint of MN
OM = OW
Prove: OW = ON

	Statement	Reason
1.	O is the midpoint of seg MN	Given
2.	Segment NO = Segment OM	Def of midpoint
3.	NO = OM	Def of cong.
4.	OM = OW	Given
5.	NO = OW	Transitive Property (Substitution)
6.	OW – NO	Symmetric Property
7.	NO = ON	Reflexive Property
8.	OW = ON	Transitive Property (Substitution)

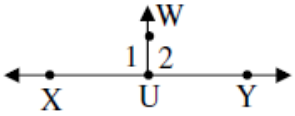


2. Given: AB = CD
Prove: AC = BD

	Statement	Reason
1.	AB = CD	Given
2.	AB + BC = CD + BC	Addition Property of Equality
3.	AB + BC = AC	Segment Addition Post
4.	CD + BC = BD	Segment Addition Post
5.	AC = BD	Substitution

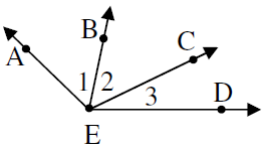
3. Given: m∠1 = 90°
Prove: m∠2 = 90°

	Statement	Reason
1.	m∠1 = 90°	Given
2.	∠1 and ∠ 2 are a linear pair	Definition of Linear Pair
3.	∠ 1 and ∠ 2 are supplementary	Linear Pair Theorem
4.	m∠1 + m∠ 2 = 180 °	Definition of Supplementary
5.	90° + m ∠ 2 = 180 °	Substitution
6.	m∠2 = 90°	Subtraction Prop of Equality



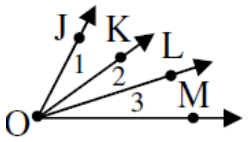
4. Given: ∠ 1 and ∠ 2 are complementary
∠ 3 and ∠ 2 are complementary
Prove: m∠1 = m ∠3

	Statement	Reason
1.	∠ 1 and ∠ 2 are complementary ∠ 3 and ∠ 2 are complementary	Given
2.	m∠1 + m∠ 2 = 90 ° m∠3 + m∠ 2 = 90 °	Definition of Complementary
3.	m∠1 + m∠ 2 = m∠3 + m∠ 2	Substitution
4.	m∠1 = m∠3	Subtraction Prop of Equality



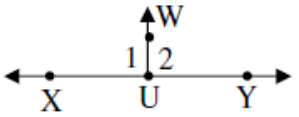
5. Given: $m\angle 1 = m\angle 3$ Prove: $m\angle JOL = m\angle KOM$

	Statement	Reason
1.	$m\angle 1 = m\angle 3$	Given
2.	$m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	Addition Property of Equality
3.	$m\angle 1 + m\angle 2 = \angle JOL$	Angle Addition Property
4.	$m\angle 2 + m\angle 3 = m\angle KOM$	Angle Addition Property
5.	$m\angle JOL = m\angle KOM$	Substitution
4.5	$m\angle 2 + m\angle 3 = m\angle 3 + m\angle 2$	*Commutative Property*



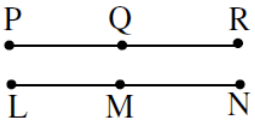
6. Given: $m\angle 1 = 90°$ Prove: $m\angle 2 + 90° = 180°$

	Statement	Reason
1.	$m\angle 1 = 90°$	Given
2.	$\angle 1$ and $\angle 2$ are a linear pair	Definition of Linear Pair
3.	$\angle 1$ and $\angle 2$ are supplementary	Linear Pair Theorem
4.	$m\angle 2 + m\angle 1 = 180°$	Definition of Supplementary
5.	$m\angle 2 + 90° = 180°$	Substitution



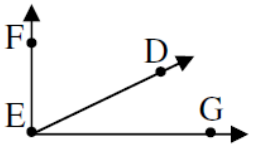
7. Given: $PR \cong LN$
Q is midpoint of PR
M is midpoint of LN
Prove: $PQ = LM$

	Statement	Reason
1.	$PR \cong LN$	Given
2.	$PR = LN$	Definition of Congruence
3.	Q is midpoint of PR; M is midpoint of LN	Given
4.	$PQ \cong QR$; $PQ = QR$	Definitions of Midpoint & Congruence
5.	$LM \cong MN$; $LM = MN$	Definitions of Midpoint & Congruence
6.	$PR = PQ + QR$; $LN = LM + MN$	Segment Addition Postulate
7.	$PQ + QR = LM + MN$	Substitution
8.	$PQ + PQ = LM + LM$	Substitution
9.	$2PQ = 2LM$	Combining Like Terms
10.	$PQ = LM$	Division Property of Equality



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

	Statement	Reason
1.	$EF \perp EG$	Given
2.	$m\angle FEG = 90°$	Definition of Perpendicular
3.	$m\angle FED + m\angle DEG = m\angle FEG$	Angle Addition Postulate
4.	$m\angle FED + m\angle DEG = 90°$	Substitution
5.	$\angle FED$ and $\angle DEG$ are complementary	Definition of Complementary



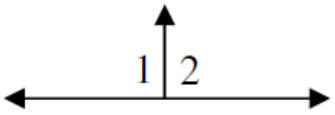
9. Given: AB ≅ CD Prove: AC ≅ BD

	Statement	Reason
1.	AB ≅ CD	Given
2.	AB = CD	Definition of Congruence
3.	AB + BC = CD + BC	Addition Postulate of Equality
4.	AB + BC = AC	Segment Addition Postulate
5.	BC + CD = BD	Segment Addition Postulate
6.	AC = BD	Substitution
7.	AB ≅ CD	Definition of Congruence

10. Given: ∠1 and ∠2 are supplementary Prove: ∠1 and ∠2 are right angles
∠1 ≅ ∠2

	Statement	Reason
1.	∠1 and ∠2 are supplementary	Given
2.	m∠1 + m∠2 = 180 °	Definition of Supplementary
3.	∠1 ≅ ∠2	Given
4.	m∠1 = m ∠2	Definition of Congruent
5.	m∠1 + m∠1 = 180 ° m∠2 + m∠2 = 180 °	Substitution
6.	2 m∠1 = 180° 2 m∠2 = 180°	Combining Like Terms
7.	m∠1 = 90° m∠2 = 90°	Division Property of Equality
8.	∠1 and ∠2 are right angles	Definition of Right Angles

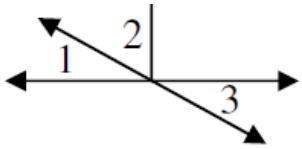
11. Given: ∠1 ≅ ∠2 Prove: ∠1 and ∠2 are right angles



	Statement	Reason
1.	∠1 ≅ ∠2	Given
2.	m∠1 = m ∠2	Definition of Congruent
3.	∠1 and ∠2 are a linear pair	Definition of Linear Pair
4.	∠1 and ∠2 are supplementary	Linear Pair Theorem
5.	m∠1 + m∠2 = 180 °	Definition of Supplementary
6.	m∠1 + m∠1 = 180 ° m∠2 + m∠2 = 180 °	Substitution
7.	2 m∠1 = 180° 2 m∠2 = 180°	Combining Like Terms
8.	m∠1 = 90° m∠2 = 90°	Division Property of Equality
9.	∠1 and ∠2 are right angles	Definition of Right Angles

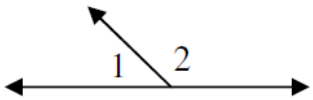
12. Given: $\angle 1$ and $\angle 2$ are complementary Prove: $\angle 2$ and $\angle 3$ are complementary

	Statement	Reason
1.	$\angle 1$ and $\angle 2$ are complementary	Given
2.	$m\angle 1 + m\angle 2 = 90°$	Definition of Complementary
3.	$\angle 1$ and $\angle 3$ are vertical angles	Definition of Vertical Angles
4.	$\angle 1$ and $\angle 3$ are congruent	Vertical Angles Theorem
5.	$m\angle 1 = m\angle 3$	Definition of Congruent
6.	$m\angle 3 + m\angle 2 = 90°$	Substitution
7.	$\angle 2$ and $\angle 3$ are complementary	Definition of Complementary



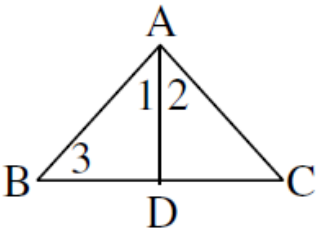
13. Given: $m\angle 2 = 2\, m\angle 1$ Prove: $m\angle 1 = 60°$

	Statement	Reason
1.	$m\angle 2 = 2\, m\angle 1$	Given
2.	$\angle 1$ and $\angle 2$ are a linear pair	Definition of Linear Pair
3.	$\angle 1$ and $\angle 2$ are supplementary	Linear Pair Theorem
4.	$m\angle 1 + m\angle 2 = 180°$	Definition of Supplementary
5.	$m\angle 1 + 2\, m\angle 1 = 180°$	Substitution
6.	$3\, m\angle 1 = 180°$	Combining Like Terms
7.	$m\angle 1 = 60°$	Division Property of Equality



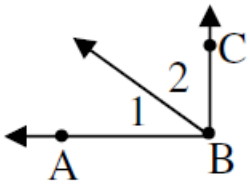
14. Given: AD bisects $\angle BAC$ Prove: $\angle 2 \cong \angle 3$
$\angle 1 \cong \angle 3$

	Statement	Reason
1.	AD bisects $\angle BAC$	Given
2.	$\angle 1 \cong \angle 2$	Definition of Bisect
3.	$\angle 1 \cong \angle 3$	Given
4.	$\angle 2 \cong \angle 3$	Substitution



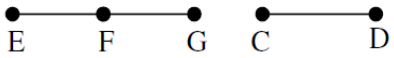
15. Given: $\angle ABC$ a right angle Prove: $\angle 1$ and $\angle 2$ are complementary

	Statement	Reason
1.	$\angle ABC$ a right angle	Given
2.	$m\angle ABC = 90°$	Definition of Right Angle
3.	$m\angle 1 + m\angle 2 = m\angle ABC$	Angle Addition Postulate
4.	$m\angle 1 + m\angle 2 = 90°$	Substitution
5.	$\angle 1$ and $\angle 2$ are complementary	Definition of Complementary



16. Given: CD ≅ EF
CD ≅ FG

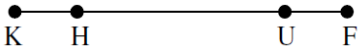
Prove: F is midpoint of EG



	Statement	Reason
1.	CD ≅ EF	Given
2.	CD ≅ FG	Given
3.	EF ≅ FG	Substitution
4.	F is midpoint of E	Definition of Midpoint

17. Given: KU ≅ HF

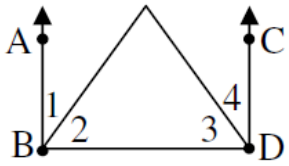
Prove: KH ≅ UF



	Statement	Reason
1.	KU ≅ HF	Given
2.	KU = HD	Definition of congruent
3.	KH + HU = KU	Segment addition postulate
4.	HU + UF = HF	Segment addition postulate
5.	KH + HU = HU + UF	Substitution
6.	KH = UF	Subtraction Prop of Equality
7.	KH ≅ UF	Definition of congruent

18. Given: ∠ ABD and ∠ CDB are right angles
m∠2 = m∠ 4

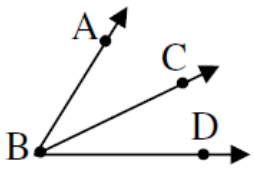
Prove: m ∠ 1 = m ∠ 3



	Statement	Reason
1.	∠ ABD and ∠ CDB are right angles	Given
2.	m ∠ ABD = 90 °; m ∠ CDB = 90 °	Definition of right angles
3.	m ∠ ABD = m ∠ CDB	Substitution
4.	m∠2 = m∠ 4	Given
5.	m∠1 + m∠ 2 = m∠ ADB m∠3 + m∠ 4 = m∠ CDB	Angle Addition Postulate
6.	m∠1 + m∠ 2 = m∠3 + m∠ 4	Substitution
7.	m∠1 + m∠ 2 = m∠3 + m∠ 2	Substitution
8.	m∠1 + m∠ 2 = m∠3 + m∠ 2	Subtraction Property of Equality

19. Given: m ∠ ABC = m ∠ CBD

Prove: BC is the bisector of ∠ABD



	Statement	Reason
1.	m ∠ ABC = m ∠ CBD	Given
2.	m ∠ ABC + m ∠ CBD = m ∠ ABD	Angle Addition Postulate
3.	m ∠ ABC ≅ m ∠ CBD	Definition of congruent
4.	BC is bisector of ∠ ABD	Definition of bisector

20. Given: m∠ABE = m∠CBE Prove: ∠ ABD and ∠ DBE are complementary

Statement	**Reason**
1. m∠ABE = m∠CBE	1. Given
2. ∠ ABE ≅ ∠ CBE	2. Def of congruent
3. ∠ ABE and ∠ CBE are a linear pair	3. Def of Linear Pair
4. " " are supplementary	4. Linear Pair Theorem
5. m∠ABE + m∠CBE = 180°	5. Def of Supp
6. m∠ABE + m∠ABE = 180°	6. Substitution
7. 2(m∠ ABE) = 180°	7. Simplify/Combine Like Terms
8. m∠ABE = 90°	8. Division Prop of E
9. m∠ABD + m∠DBE = m∠ABE	9. Angle Addition Prop
10. m∠ABD + m∠DBE = 90°	10. Substitution
11. ∠ABD and ∠DBE are complementary	11. Def of Comp