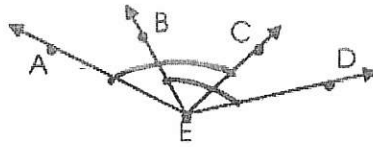


6.2A Line Segment and Angle Proofs

Name: Key Hr: _____

1. Given: $\angle AEC \cong \angle DEB$
 Prove: $\angle AEB \cong \angle DEC$



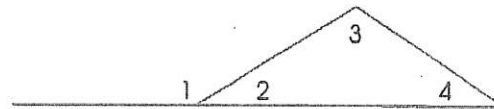
Statements	Reasons
1. $\angle AEC \cong \angle DEB$	1. Given
2. $m\angle AEC = m\angle DEB$	2. Definition of Congruent Angles
3. $m\angle AEB + m\angle BEC = m\angle AEC$	3. Angle Addition Postulate
4. $m\angle DEC + m\angle BEC = m\angle DEB$	4. Angle Addition Postulate
5. $m\angle AEB + m\angle BEC = m\angle DEC + m\angle BEC$	5. Substitution Prop. \cong
6. $m\angle AEB = m\angle DEC$	6. Subtraction Prop. \cong - BEC from both sides
7. $\angle AEB \cong \angle DEC$	7. Definition of Congruent Angles

2. Given: $\overline{BC} \cong \overline{DE}$
 Prove: $AC = AB + DE$



Statements	Reasons
1. $\overline{BC} \cong \overline{DE}$	1. Given
2. $BC = DE$	2. Definition of Congruent Segments
3. $AC = AB + BC$	3. Segment Addition Postulate
4. $AC = AB + DE$	4. Substitution Prop. \cong

3. Given: $\angle 1$ and $\angle 2$ form a linear pair;
 $m\angle 2 + m\angle 3 + m\angle 4 = 180^\circ$
 Prove: $m\angle 1 = m\angle 3 + m\angle 4$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a linear pair	1. Given
2. $\angle 1$ and $\angle 2$ are supplementary	2. Definition of Linear Pair
3. $m\angle 2 + m\angle 3 + m\angle 4 = 180^\circ$	3. Given
4. $m\angle 1 + m\angle 2 = 180^\circ$	4. Definition of Supplementary Angles
5. $m\angle 2 = m\angle 2$	5. Reflexive Prop. \cong
6. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3 + m\angle 4$	6. Substitution Prop. \cong
7. $m\angle 1 = m\angle 3 + m\angle 4$	7. Subtraction Prop. \cong

4. Given: B is between A and D; C is between A and D
 Prove: $AB + BD = AC + CD$

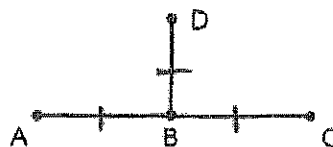


Statements	Reasons
1. B is between A and D; C is between A and D	1. Given
2. $AB + BD = AD$	2. Segment Addition Postulate
3. $AC + CD = AD$	3. Segment Addition Postulate
4. $AD = AC + CD$	4. Symmetric Prop. \cong
5. $AB + BD = AC + CD$	5. Substitution Prop. \cong

5. Given: $3x - 2 = x - 8$
 Prove: $x = -3$

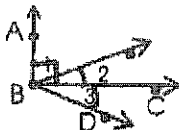
Statements	Reasons
1. $3x - 2 = x - 8$	1. Given
2. $3x - 2 + 2 = x - 8 + 2$	2. Addition Prop. \cong
3. $3x + 0 = x - 6$	3. Substitution
4. $3x + (-x) = x + (-x) - 6$	4. Subtraction Prop. \cong
5. $2x = -6$	5. Substitution
6. $x = -3$	6. Division Prop. \cong

6. Given: $A, B,$ and C are collinear; $AB = BD$; $BD = BC$
 Prove: B is the midpoint of \overline{AC}



Statements	Reasons
1. A, B, C collinear, $AB = BD$, $BD = BC$	1. Given
2. $AB = BC$	2. Transitive Property of Equality
3. $\overline{AB} \cong \overline{BC}$	3. Definition of Congruent Segments
4. B is the midpoint of \overline{AC}	4. Definition of Midpoint

7. Given: $\overline{AB} \perp \overline{BC}$; $m\angle 2 = m\angle 3$
 Prove: $m\angle 1 + m\angle 3 = 90^\circ$



Statements	Reasons
1. $\overline{AB} \perp \overline{BC}$; $m\angle 2 = m\angle 3$	1. Given
2. $\angle ABC$ is a right angle	2. Definition of Perpendicular
3. $m\angle ABC = 90^\circ$	3. Definition of Right Angle
4. $m\angle ABC = m\angle 1 + m\angle 2$	4. Angle Addition Postulate
5. $m\angle 1 + m\angle 2 = 90^\circ$	5. Substitution Prop. \cong (or transitive)
6. $m\angle 1 + m\angle 3 = 90^\circ$	6. Substitution Prop. \cong

8. Given: $AD = 2AB + BC$
 Prove: $\overline{AB} \cong \overline{CD}$



Statements	Reasons
1. $AD = 2AB + BC$	1. Given
2. $AD = AB + BC + CD$	2. Segment Addition Postulate
3. $2AB + BC = AB + BC + CD$	3. Substitution Prop. \cong
4. $AB = AB$; $BC = BC$	4. Reflexive Prop. \cong
5. $2AB = AB + CD$	5. Subtraction Prop. \cong
6. $AB = CD$	6. Subtraction Prop. \cong
7. $\overline{AB} \cong \overline{CD}$	Definition of congruent segments