2.6 – Geometric Proofs (Day 3)

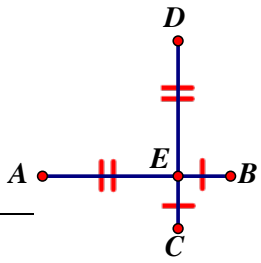
EX 1) Given: X is the midpoint of $\overline{AY}$, Y is the midpoint of $\overline{XB}$

Prove: $\overline{AX} \cong \overline{YB}$

STATEMENTS	REASONS
1. X is the midpoint of $\overline{AY}$	1. Given
2. $\overline{AX} \cong \overline{XY}$	2. Definition of midpoint
3. Y is the midpoint of $\overline{XB}$	3. Given
4. $\overline{XY} \cong \overline{YB}$	4. Definition of midpoint
5. $\overline{AX} \cong \overline{YB}$	5. Transitive / Substitution Property

EX 2) Given: $\overline{BE} \cong \overline{CE}$, $\overline{DE} \cong \overline{AE}$

Prove: $\overline{AB} \cong \overline{CD}$

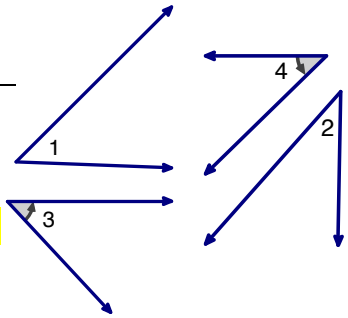


STATEMENTS	REASONS
1. $\overline{BE} \cong \overline{CE}$, $\overline{DE} \cong \overline{AE}$	1. Given
2. $BE = CE$, $DE = AE$	2. Definition of $\cong$ segments
3. $AB = AE + EB$, $DC = ED + EC$	3. Segment Addition Postulate
4. $AB = DE + CE$, $DC = ED + EC$	4. Substitution Property
5. $AB = CD$	5. Transitive Property
6. $\overline{AB} \cong \overline{CD}$	6. Definition of $\cong$ segments

2.6 – Geometric Proofs (Day 3)

EX 3) Given: $\angle 1$ and $\angle 3$ are complementary, $\angle 2$ and $\angle 4$ are complementary, $\angle 3 \cong \angle 4$

Prove: $\angle 1 \cong \angle 2$



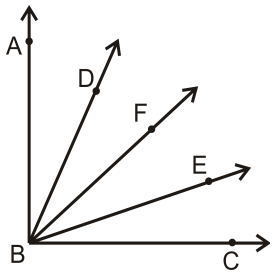
STATEMENTS	REASONS
1. $\angle 1$ and $\angle 3$ are complementary $\angle 2$ and $\angle 4$ are complementary	1. Given
2. $m\angle 1 + m\angle 3 = 90°$ $m\angle 2 + m\angle 4 = 90°$	2. Definition of Complementary $\angle$s
3. $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 4$	3. Transitive / Substitution Property
4. $\angle 3 \cong \angle 4$	4. Given
5. $m\angle 3 = m\angle 4$	5. Definition of $\cong$ $\angle$s
6. $m\angle 1 + m\angle 4 = m\angle 2 + m\angle 4$ $\left(\text{or } m\angle 1 + m\angle 3 = m\angle 2 + m\angle 3\right)$	6. Substitution Property
7. $m\angle 4 = m\angle 4$ $\left(\text{or } m\angle 3 = m\angle 3\right)$	7. Reflexive Property
8. $m\angle 1 = m\angle 2$	8. Subtraction Property
9. $\angle 1 \cong \angle 2$	9. Definition of $\cong$ $\angle$s

2.6 – Geometric Proofs (Day 3)

EX 4) Given that $\overline{AC} \cong \overline{BD}$, prove that $\overline{AB} \cong \overline{CD}$.

STATEMENTS	REASONS
1. $\overline{AC} \cong \overline{BD}$	1. Given
2. $AC = BD$	2. Definition of $\cong$ segments
3. $AC = AB + BC,\ \ BD = BC + CD$	3. Segment Addition Postulate
4. $BD = AB + BC$ $\left(\text{or } AC = BC + CD\right)$	4. Substitution Property
5. $AB + BC = BC + CD$	5. Transitive / Substitution Property
6. $BC = BC$	6. Reflexive Property
7. $AB = CD$	7. Subtraction Property
8. $\overline{AB} \cong \overline{CD}$	8. Definition of $\cong$ segments

2.6 – Geometric Proofs (Day 3)



EX 5) Given: $\overrightarrow{BF}$ bisects $\angle ABC$, $\angle ABD \cong \angle EBC$

Prove: $\angle DBF \cong \angle FBE$

STATEMENTS	REASONS
1. $\overrightarrow{BF}$ bisects $\angle ABC$	1. Given
2. $\angle ABF \cong \angle FBC$	2. Definition of $\angle$ bisector
3. $m\angle ABF = m\angle FBC$	3. Definition of $\cong$ $\angle$s
4. $m\angle ABF = m\angle ABD + m\angle DBF$ $m\angle FBC = m\angle FBE + m\angle EBC$	4. $\angle$ Addition Postulate
5. $m\angle FBC = m\angle ABD + m\angle DBF$ $(\text{or } m\angle ABF = m\angle FBE + m\angle EBC)$	5. Substitution Property
6. $m\angle ABD + m\angle DBF = m\angle FBE + m\angle EBC$	6. Transitive / Substitution Property
7. $\angle ABD \cong \angle EBC$	7. Given
8. $m\angle ABD = m\angle EBC$	8. Definition of $\cong$ $\angle$s
9. $m\angle EBC + m\angle DBF = m\angle FBE + m\angle EBC$	9. Substitution Property
10. $m\angle EBC = m\angle EBC$	10. Reflexive Property
11. $m\angle DBF = m\angle FBE$	11. Subtraction Property
12. $\angle DBF \cong \angle FBE$	12. Definition of $\cong$ $\angle$s