

1.)

Statements	Reasons
1. $\angle AVB$ and $\angle BVC$ are complementary	1. Given
2. $m\angle AVB + m\angle BVC = 90$	2. Definition of Complementary Angles
3. $m\angle AVB + m\angle BVC = m\angle AVC$	3. AAP
4. $m\angle AVC = 90$	4. Transitive
5. $\angle AVC$ is a right angle	5. Definition of Right Angle

2.)

Statements	Reasons
1. $\angle ABC$ and $\angle DCB$ are right angles $\angle ABE \cong \angle DCE$	1. Given
2. $m\angle ABC = 90$ and $m\angle DCB = 90$	2. Definition of Right Angles
3. $m\angle ABE = m\angle DCE$	3. Definition of Congruent Angles
4. $m\angle ABE + m\angle EBC = m\angle ABC$ $m\angle DCE + m\angle ECB = m\angle DCB$	4. AAP
5. $m\angle ABE + m\angle EBC = 90$ $m\angle DCE + m\angle ECB = 90$	5. Substitution
6. $m\angle ABE + m\angle EBC = m\angle DCE + m\angle ECB$	6. Transitive
7. $m\angle ABE + m\angle EBC = m\angle ABE + m\angle ECB$	7. Substitution (2 into 6)
8. $m\angle EBC = m\angle ECB$	8. Subtraction
9. $\angle EBC \cong \angle ECB$	9. Definition of Congruent Angles

3.)

Statements	Reasons
1. $\angle 8 \cong \angle 4$ $\angle 8$ and $\angle 7$ form a linear pair $\angle 4$ and $\angle 3$ form a linear pair	1. Given
2. $m\angle 8 = m\angle 4$	2. Definition of Congruent Angles
3. $m\angle 8 + m\angle 7 = 180$ $m\angle 4 + m\angle 3 = 180$	3. Definition of Linear Pair
4. $m\angle 8 + m\angle 7 = m\angle 4 + m\angle 3$	4. Transitive
5. $m\angle 8 + m\angle 7 = m\angle 8 + m\angle 3$	5. Substitution
6. $m\angle 7 = m\angle 3$	6. Subtraction
7. $\angle 7 \cong \angle 3$	7. Definition of Congruent Angles

Statements	Reasons
1. $\angle 2 \cong \angle 6$	1. Given
2. $\angle 2 \cong \angle 8$ $\angle 6 \cong \angle 4$	2. VAT
3. $\angle 8 \cong \angle 6$	3. Transitive
4. $\angle 8 \cong \angle 4$	4. Transitive

Statements	Reasons
1. $\angle 1 \cong \angle 3$ $\angle 1$ and $\angle 2$ form a linear pair	1. Given
2. $m\angle 1 = m\angle 3$	2. Definition of Congruent Angles
3. $m\angle 1 + m\angle 3 = 180$	3. Definition of Linear Pair
4. $m\angle 2 + m\angle 3 = 180$	4. Transitive
5. $\angle 2$ and $\angle 3$ are supplementary	5. Definition of Supplementary Angles

Statements	Reasons
1. $\angle 2 \cong \angle 3$ $\angle 1$ and $\angle 2$ form a linear pair $\angle 3$ and $\angle 4$ form a linear pair	1. Given
2. $m\angle 2 = m\angle 3$	2. Definition of Congruent Angles
3. $m\angle 1 + m\angle 2 = 180$ $m\angle 3 + m\angle 4 = 180$	3. Definition of Linear Pair
4. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	4. Transitive
5. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 4$	5. Substitution
6. $m\angle 1 = m\angle 4$	6. Subtraction
7. $\angle 1 \cong \angle 4$	7. Definition of Congruent Angles

7.)

Statements	Reasons
1. $\angle 1$ is complementary to $\angle 4$ $\angle 2$ is complementary to $\angle 3$ $\overline{AC}$ bisects $\angle BAD$	1. Given
2. $m\angle 1 + m\angle 4 = 90$ $m\angle 2 + m\angle 3 = 90$	2. Definition of Complementary Angles
3. $m\angle 1 + m\angle 4 = m\angle 2 + m\angle 3$	3. Transitive
4. $\angle 3 \cong \angle 4$	4. Definition of Angle Bisector
5. $m\angle 3 = m\angle 4$	5. Definition of Congruent Angles
6. $m\angle 1 + m\angle 4 = m\angle 2 + m\angle 4$	6. Substitution
7. $m\angle 1 = m\angle 2$	7. Subtraction
8. $\angle 1 \cong \angle 4$	8. Definition of Congruent Angles

8.)

Statements	Reasons
1. $\angle AFE \cong \angle DEF$ $\overline{FC}$ bisects $\angle AFE$ $\overline{EB}$ bisects $\angle DEF$	1. Given
2. $\angle AFC \cong \angle CFE$ $\angle DEB \cong \angle BEF$	2. Definition of Angle Bisector
3. $m\angle AFE = m\angle DEF$ $m\angle AFC = m\angle CFE$ $m\angle DEB = m\angle BEF$	3. Definition of Congruent Angles
4. $m\angle AFC + m\angle CFE = m\angle AFE$ $m\angle DEB + m\angle BEF = m\angle DEF$	4. AAP
5. $m\angle AFC + m\angle CFE = m\angle AFE$ $m\angle DEB + m\angle BEF = m\angle AFE$	5. Substitution
6. $m\angle AFC + m\angle CFE = m\angle DEB + m\angle BEF$	6. Transitive
7. $m\angle AFC + m\angle AFC = m\angle DEB + m\angle DEB$	7. Substitution
8. $2m\angle AFC = 2m\angle DEB$	8. Simplify
9. $m\angle AFC = m\angle DEB$	9. Division
10. $\angle AFC \cong \angle DEB$	10. Definition of Congruent Angles

	Statements	Reasons
9.)	1. $\angle AVC \cong \angle BVD$	1. Given
	2. $m\angle AVC = m\angle BVD$	2. Definition of Congruent Angles
	3. $m\angle AVB + m\angle BVC = m\angle AVC$ $m\angle CVD + m\angle BVC = m\angle BVD$	3. AAP
	4. $m\angle AVB + m\angle BVC = m\angle AVC$ $m\angle CVD + m\angle BVC = m\angle AVC$	4. Substitution
	5. $m\angle AVB + m\angle BVC = m\angle CVD + m\angle BVC$	5. Transitive
	6. $m\angle AVB = m\angle CVD$	6. Subtraction
	7. $\angle AVB \cong \angle CVD$	7. Definition of Congruent Angles

	Statements	Reasons
10.)	1. $\overline{AB} \cong \overline{CD}$	1. Given
	2. $AB = CD$	2. Definition of Congruent Segments
	3. $AB + BC = AC$ $CD + BC = BD$	3. SAP
	4. $AB + BC = AC$ $AB + BC = BD$	4. Substitution
	5. $AC = BD$	5. Transitive
	6. $\overline{AC} \cong \overline{BD}$	6. Definition of Congruent Segments

	Statements	Reasons
11.)	1. $\angle BAC$ is complementary to $\angle ACB$ $\angle DEC$ is complementary to $\angle ECD$	1. Given
	2. $m\angle BAC + m\angle ACB = 90$ $m\angle DEC + m\angle ECD = 90$	2. Definition of Complementary Angles
	3. $m\angle BAC + m\angle ACB = m\angle DEC + m\angle ECD$	3. Transitive
	4. $\angle ACB \cong \angle ECD$	4. VAT
	5. $m\angle ACB \cong m\angle ECD$	5. Definition of Congruent Angles
	6. $m\angle BAC + m\angle ACB = m\angle DEC + m\angle ACB$	6. Substitution
	7. $m\angle BAC = m\angle DEC$	7. Subtraction
	8. $\angle BAC \cong \angle DEC$	8. Definition of Congruent Angles

12.) See notes: Just like complementary proof example from Wednesday (9/24/08)

Statements	Reasons
<p>1. <math>\angle 1 \cong \angle 2</math>  <math>\overline{BX}</math> bisects <math>\angle ABY</math>  <math>\overline{CZ}</math> bisects <math>\angle DCY</math>  <math>\angle ABY</math> and <math>\angle 1</math> form a linear pair  <math>\angle YCD</math> and <math>\angle 2</math> form a linear pair</p>	1. Given
<p>2. <math>\angle 5 \cong \angle 3</math>  <math>\angle 4 \cong \angle 6</math></p>	2. Definition of Angle Bisector
<p>3. <math>m\angle 5 = m\angle 3</math>  <math>m\angle 4 = m\angle 6</math>  <math>m\angle 1 = m\angle 2</math></p>	3. Definition of Congruent Angles
<p>4. <math>m\angle ABY + m\angle 1 = 180</math>  <math>m\angle YCD + m\angle 2 = 180</math></p>	4. Definition of Linear Pair
5. $m\angle ABY + m\angle 1 = m\angle YCD + m\angle 2$	5. Transitive
6. $m\angle ABY + m\angle 1 = m\angle YCD + m\angle 1$	6. Substitution
7. $m\angle ABY = m\angle YCD$	7. Subtraction
<p>8. <math>m\angle 5 + m\angle 3 = m\angle ABY</math>  <math>m\angle 4 + m\angle 6 = m\angle YCD</math></p>	8. AAP
<p>9. <math>m\angle 5 + m\angle 3 = m\angle ABY</math>  <math>m\angle 4 + m\angle 6 = m\angle ABY</math></p>	9. Substitution
10. $m\angle 5 + m\angle 3 = m\angle 4 + m\angle 6$	10. Transitive
11. $m\angle 3 + m\angle 3 = m\angle 4 + m\angle 4$	11. Substitution (from 3)
12. $2m\angle 3 = 2m\angle 4$	12. Simplify
13. $m\angle 3 = m\angle 4$	13. Division
14. $\angle 3 \cong \angle 4$	14. Division

13.)

14.)

Statements	Reasons
1. $m\angle A + m\angle ABC + m\angle ACB = 180$ $m\angle D + m\angle DBC + m\angle DCB = 180$ $\overline{BD}$ bisects $\angle ABC$ $\overline{CD}$ bisects $\angle ACB$	1. Given
2. $\angle ACD \cong \angle DCB$ $\angle ABD \cong \angle DBC$	2. Definition of Angle Bisector
3. $m\angle ACD = m\angle DCB$ $m\angle ABD = m\angle DBC$	3. Definition of Congruent Angles
4. $m\angle ABD + m\angle DBC = m\angle ABC$ $m\angle ACD + m\angle DCB = m\angle ACB$	4. AAP
5. $m\angle DBC + m\angle DBC = m\angle ABC$ $m\angle DCB + m\angle DCB = m\angle ACB$	5. Substitution
6. $2m\angle DBC = m\angle ABC$ $2m\angle DCB = m\angle ACB$	6. Simplify
7. $m\angle A + 2m\angle DBC + 2m\angle DCB = 180$ $m\angle D + m\angle DBC + m\angle DCB = 180$	7. Substitution (into 1)
8. $\frac{m\angle A}{2} + m\angle DBC + m\angle DCB = 90$	8. Division
9. $\frac{m\angle A}{2} + m\angle DBC + m\angle DCB + 90 = 180$	9. Addition
10. $m\angle D + m\angle DBC + m\angle DCB = \frac{m\angle A}{2} + m\angle DBC + m\angle DCB + 90$	10. Transitive (=s in 7 and 9)
11. $m\angle D = \frac{m\angle A}{2} + 90$	11. Subtraction