Honors Geometry
Review – Two Column Proofs

Name KEY
Date _____ Pd _____

1. Given: $4+2(3x+5)=11-x$

Prove: $x=-\frac{3}{7}$

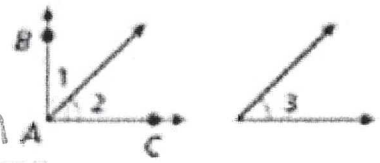
Statement	Justification
1. $4+2(3x+5)=11-x$	1. Given
2. $4+6x+10=11-x$	2. Distributive Property
3. $6x+14=11-x$	3. Simplify
4. $7x+14=11$	4. Addition P.O.E
5. $7x=-3$	5. Subtraction P.O.E
6. $x=-\frac{3}{7}$	6. Division P.O.E

2. Given: $3x^2-2x-4=2x(x-1)+12$
$x<0$

Prove: $x=-4$

Statement	Justification
1. $3x^2-2x-4=2x(x-1)+12$	1. Given
2. $3x^2-2x-4=2x^2-2x+12$	2. Distributive Property
3. $x^2-2x-4=-2x+12$	3. Subtraction POE
4. $x^2-4=12$	4. Addition P.O.E
5. $x^2=16$	5. Addition P.O.E
6. $x=-4$ or $x=4$	6. Def of a square root
7. $x<0$ 8. $x=-4$	7. Given 8. OR Rule

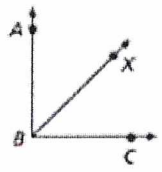
3. Given: <BAC is a right angle. <2 ≅ <3.
Prove: <1 and <3 are complementary.



Statement	Justification
1. $\angle BAC$ is a right angle	1. Given
2. $m\angle BAC=90°$	2. Def of a right angle
3. $m\angle 1+m\angle 2=m\angle BAC$	3. Angle Add. Postulate
4. $m\angle 1+m\angle 2=90°$	4. Substitution P.O.E.
5. $\angle 2\cong\angle 3$	5. Given
6. $m\angle 2=m\angle 3$	6. Def of Congruence
7. $m\angle 1+m\angle 3=90$	7. Substitution P.O.E
8. $\angle 1$ and $\angle 3$ are complementary angles.	8. Def of complementary angles

4. Given: $\overrightarrow{BX}$ bisects $< ABC$. $m < XBC = 45$

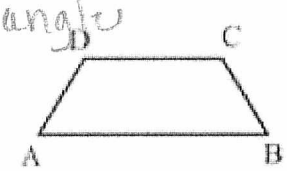
Prove: $< ABC$ is a right angle.



Statement	Justification
1. $\overrightarrow{BX}$ bisects $\angle ABC$	1. Given
2. $\angle ABX \cong \angle CBX$	2. Def of a bisector
3. $m\angle ABX = m\angle CBX$	3. Def of congruency
4. $m < XBC = 45°$	4. Given
5. $m\angle ABX = 45°$	5. Substitution
6. $m\angle ABX + m\angle XBC = m\angle ABC$	6. Angle Addition Post.
7. $45 + 45 = m\angle ABC$	7. Substitution P.O.E
8. $90 = m\angle ABC$	8. Simplify
9. $\angle ABC$ is a right angle	9. Def of a right angle

5. Given: $AD = 8$, $BC = 8$, $BC \cong CD$

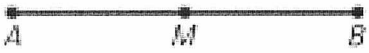
Prove: $\overline{AD} \cong \overline{CD}$



Statement	Justification
1. $AD = 8$, $BC = 8$	1. Given
2. $\overline{BC} \cong \overline{CD}$	2. Given
3. $BC = CD$	3. Def of congruency
4. $CD = 8$	4. Substitution POE
5. $AD = CD$	5. Substitution POE
6. $\overline{AD} \cong \overline{CD}$	6. Def of congruency

6. Given: M is the midpoint of $\overline{AB}$

Prove: $AM = \frac{1}{2}AB$

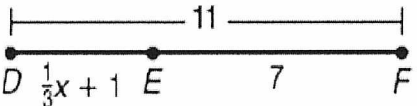


Statement	Justification
1. M is the midpt of $\overline{AB}$	1. Given
2. $\overline{AM} \cong \overline{MB}$	2. Def of a midpt
3. $AM = MB$	3. Def of congruency
4. $AM + MB = AB$	4. Segment Addition Post.
5. $AM + AM = AB$	5. Substitution P.O.E
6. $2AM = AB$	6. Simplify
7. $AM = \frac{1}{2}AB$	7. multiplication POE (or division POE)

7. Given: $3x - 4 = \frac{1}{2}(x + 12)$
Prove: $x = 4$

Statement	Justification
1. $3x-4=\frac{1}{2}(x+12)$	1. Given
2. $3x-4=\frac{1}{2}x+6$	2. Distributive Property
3. $\frac{5}{2}x-4=6$	3. Subtraction POE
4. $\frac{5}{2}x=10$	4. Addition POE
5. $x=4$	5. Multiplication POE (Division POE)

8. Given: Figure at the right...
Prove: $x = 9$



Statement	Justification
1. $DF=11$, $DE=\frac{1}{3}x+1$, $EF=7$	1. Given
2. $DE+EF=DF$	2. Segment Addition Postulate
3. $\frac{1}{3}x+1+7=11$	3. Substitution POE
4. $\frac{1}{3}x+8=11$	4. Simplify
5. $\frac{1}{3}x=3$	5. Subtraction POE
6. $x=9$	6. Multiplication POE (Division POE)

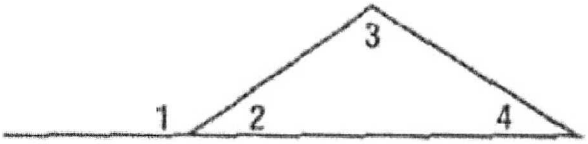
9. Given: $2x^2 - 3x - 16 = -x^2 - (3x + x^2)$
$x < 0$
Prove: $x = -2$

Statement	Justification
1. $2x^2-3x-16=-x^2-(3x+x^2)$	1. Given
2. $2x^2-3x-16=-x^2-3x-x^2$	2. Distributive Property
3. $2x^2-3x-16=-2x^2-3x$	3. Simplify
4. $2x^2-16=-2x^2$	4. Addition POE
5. $4x^2-16=0$	5. Addition POE
6. $4x^2=16$	6. Addition POE
7. $x^2=4$	7. Division POE
8. $x=2$ or $x=-2$	8. Def of a square root
9. $x<0$ 10. $x=-2$	9. Given 10. OR Rule

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

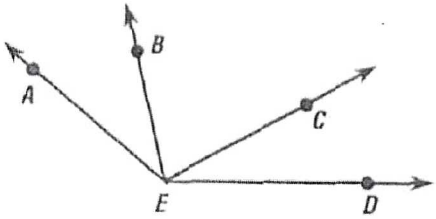
Statement	Justification
1. $AD = 2AB + BC$	1. Given
2. $AD = AB + BC + CD$	2. Segment Addition Postulate
3. $2AB + BC = AB + BC + CD$	3. Substitution POE
4. $2AB = AB + CD$	4. Subtraction POE
5. $AB = CD$	5. Subtraction POE
6. $\overline{AB} \cong \overline{CD}$	6. Def. of congruence

11. Given: $\angle 1$ *and* $\angle 2$ *form a linear pair.*
$m\angle 2 + m\angle 3 + m\angle 4 = 180°$
Prove: $m\angle 1 = m\angle 3 + m\angle 4$



Statement	Justification
1. $\angle 1$ and $\angle 2$ form a linear pair	1. Given
2. $\angle 1$ and $\angle 2$ are supp. $\angle$s	2. Linear Pair Thm
3. $m\angle 1 + m\angle 2 = 180$	3. Def of supp $\angle$s
4. $m\angle 2 + m\angle 3 + m\angle 4 = 180$	4. Given
5. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3 + m\angle 4$	5. Substitution POE
6. $m\angle 1 = m\angle 3 + m\angle 4$	6. Subtraction POE

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



Statement	Justification
1. $\angle AEC \cong \angle DEB$	1. Given
2. $m\angle AEC = m\angle DEB$	2. Def of congruence
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 POE
6. $m\angle AEB = m\angle DEC$	6. Subtraction POE
7. $\angle AEB \cong \angle DEC$	7. Def of congruence