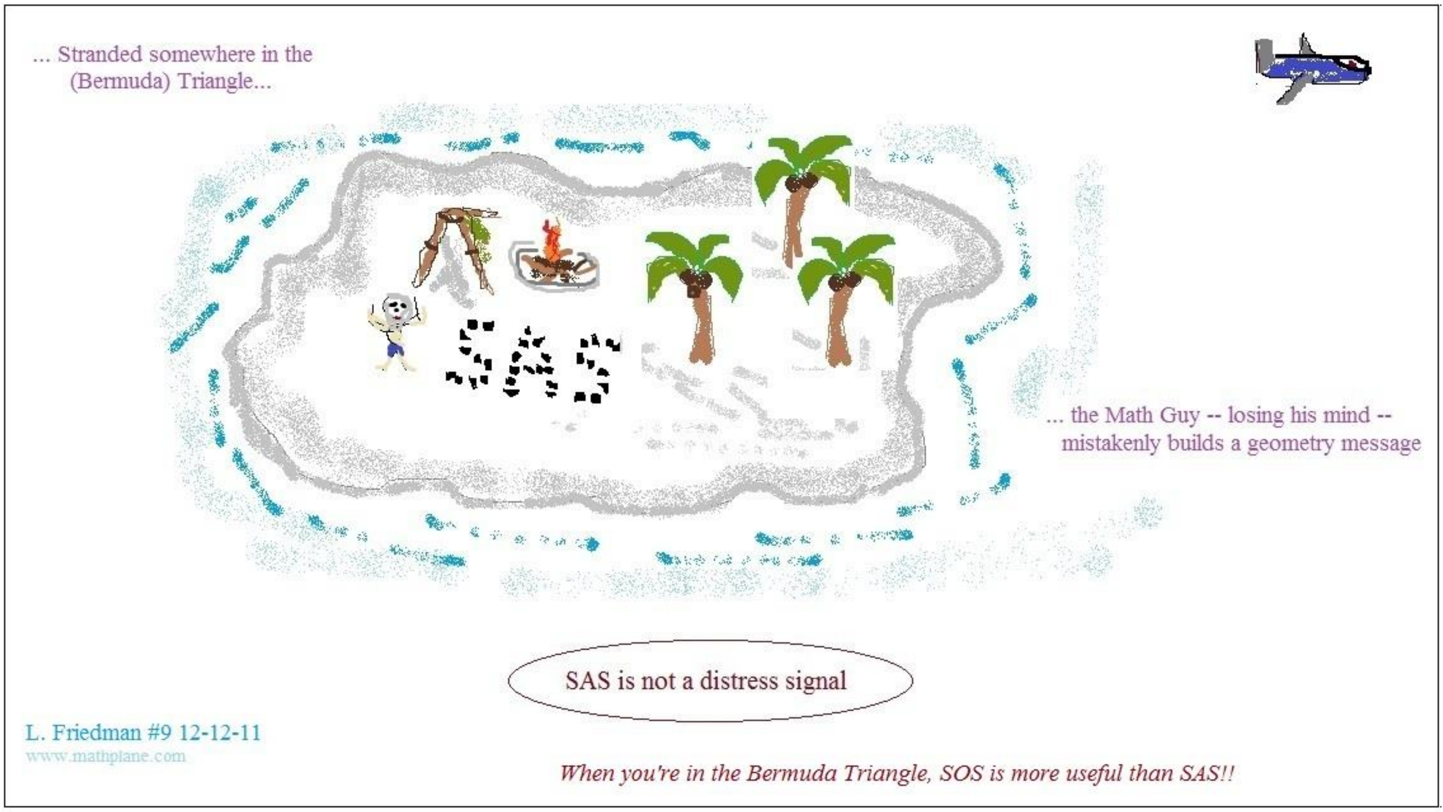
Geometry: Proofs and Postulates Worksheet

Practice Exercises (w/ Solutions)

Statements	Reasons
1. $\overline{AD}$ and $\overline{BC}$ bisect each other	1. Given
2. $\overline{AM} \cong \overline{DM}$; $\overline{CM} \cong \overline{BM}$	2. Definition of bisector
3. $\angle AMC \cong \angle BMD$	3. Vertical angles are congruent
4. $\triangle AMC \cong \triangle DMB$	4. Side-Angle-Side (SAS) (2, 3, 2)
5. $\overline{AC} \cong \overline{BD}$	5. CPCTC (Corresponding Parts of Congruent Triangles are Congruent)

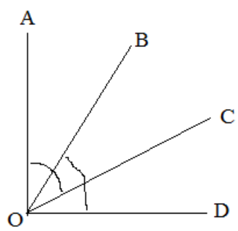
Topics include triangle characteristics, quadrilaterals, circles, midpoints, SAS, and more.



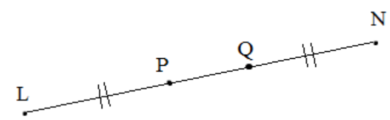
PRACTICE EXERCISES -→

Introduction to proofs: Identifying theorems and postulates

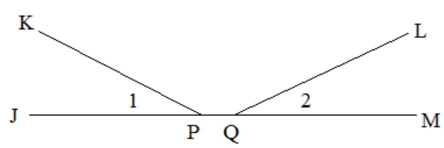
1) Why is $\angle AOB \cong \angle COD$?



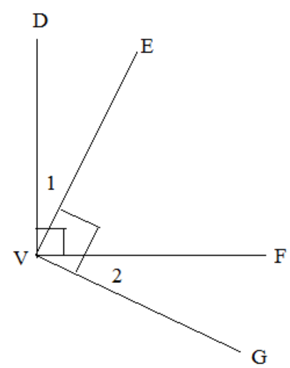
2) Why are $\overline{LQ}$ and $\overline{PN}$ congruent segments?



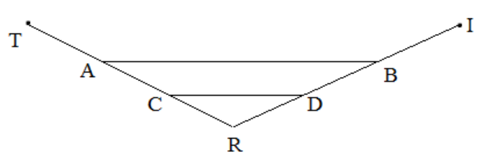
3) Angles 1 and 2 are congruent.
Why are $\angle$ KPM and $\angle$LQJ congruent?



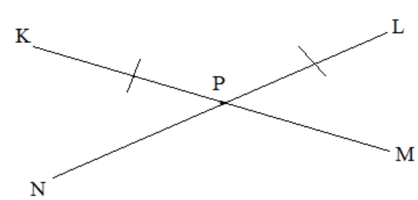
4) DV $\perp$ VF and EV $\perp$ VG
Why is angle 1 congruent to angle 2?



5) If TR = RI, and AB and CD are trisectors,
why are CR and BD congruent segments?



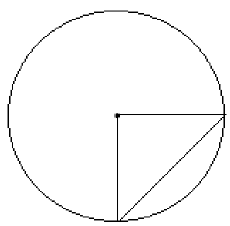
6) KM and LN bisect each other.
Is KM congruent to NL?



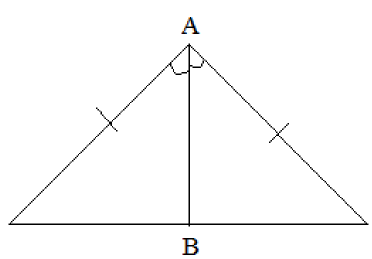
Introduction to proofs: Identifying geometry theorems and postulates

Explain using geometry concepts and theorems:

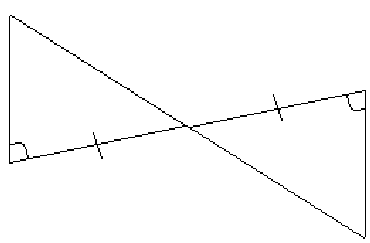
1) Why is the triangle isosceles?



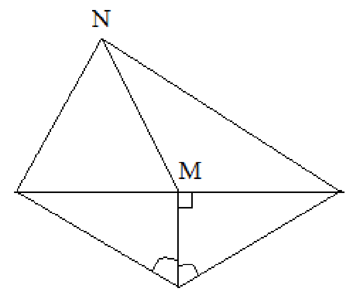
2) Why is $\overline{AB}$ an altitude?



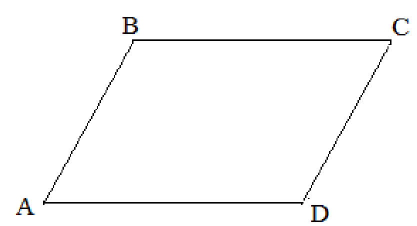
3) Why are the triangles congruent?



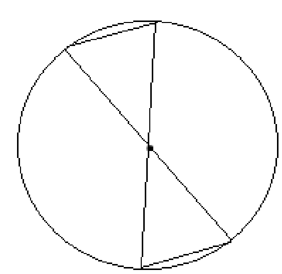
4) Why is $\overline{NM}$ a median?



5) If ABCD is a parallelogram, why are $\angle A$ and $\angle C$ congruent?



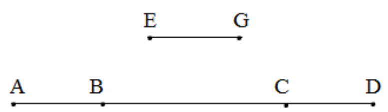
6) Why are the triangles congruent?



Geometry Proofs

A) Given: $\overline{AB} \cong \overline{EG}$
$\overline{CD} \cong \overline{EG}$

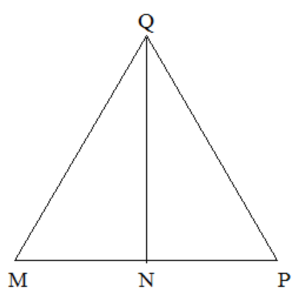
Prove: $\overline{AC} \cong \overline{BD}$



Statements	Reasons

B) Given: $\angle M$ is the complement to $\angle MQN$
$\angle P$ is the complement to $\angle PQN$
$\overline{NQ}$ bisects $\angle MQP$

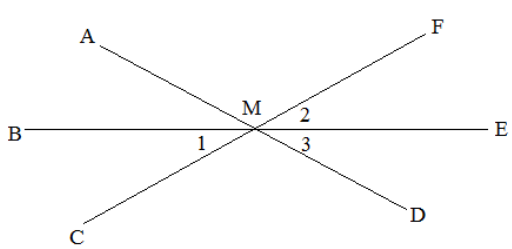
Prove: $\angle M \cong \angle P$



Statements	Reasons

C) Given: $\overline{BE}$ bisects $\angle FMD$

Prove: $\angle 1 \cong \angle 3$

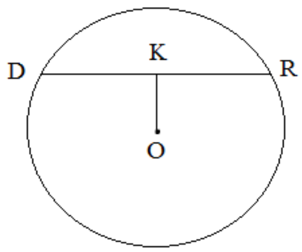


Statements	Reasons

Geometry Proofs

1) Given: $\odot O$; $\overline{DR} \perp \overline{OK}$

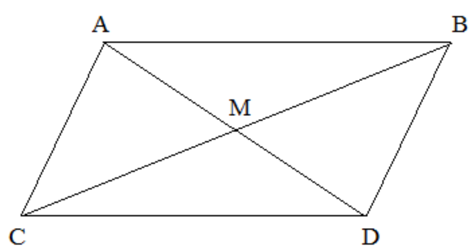
Prove: $\overline{DK} \cong \overline{KR}$



Statements	Reasons

2) Given: $\overline{AD}$ and $\overline{BC}$ bisect each other

Prove: $\overline{AC} \cong \overline{BD}$

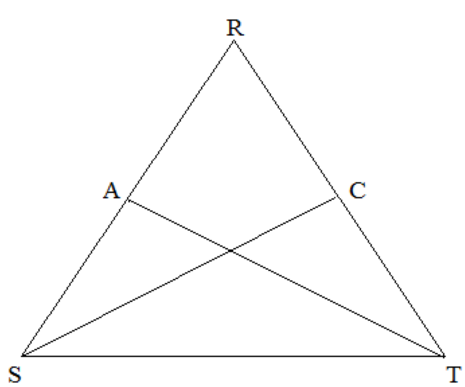


Statements	Reasons

3) Given: $\overline{RS} \cong \overline{RT}$

$\overline{AT}$ and $\overline{CS}$ are medians

Prove: $\overline{AT}$ and $\overline{CS}$ are congruent

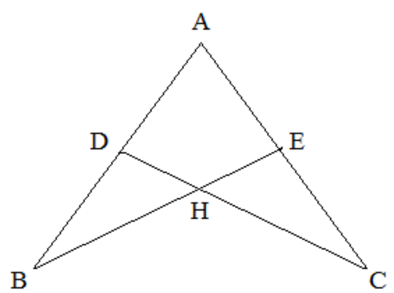


Statements	Reasons

Geometry Proofs

4) Given: $\overline{AC} \cong \overline{AB}$
D and E are midpoints

Prove: $\angle B \cong \angle C$



Statements	Reasons

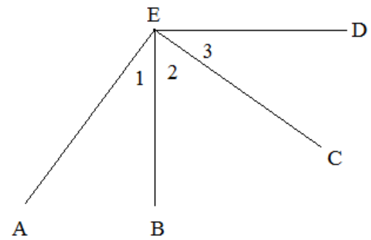
5) Prove the diagonals of an isosceles trapezoid are congruent.

Statements	Reasons

6) Given: $\overline{AE} \perp \overline{EC}$

$\overline{BE} \perp \overline{ED}$

Prove: $\angle 1 = \angle 3$



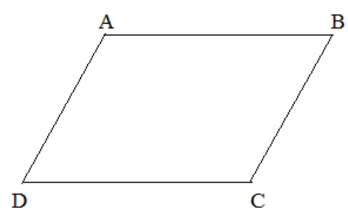
Statements	Reasons

7) Given: $\overline{AB} \parallel \overline{CD}$

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

Prove: $\overline{AD} \parallel \overline{BC}$

(Hint: Use an auxilary line segment)

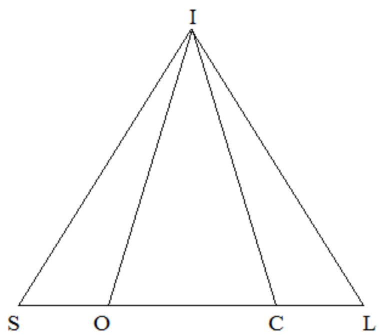


Statements	Reasons

8) Given: △ OIC is an isosceles triangle (with base OC)

$\overline{SO} \cong \overline{CL}$

Prove: △ ISL is an isosceles triangle



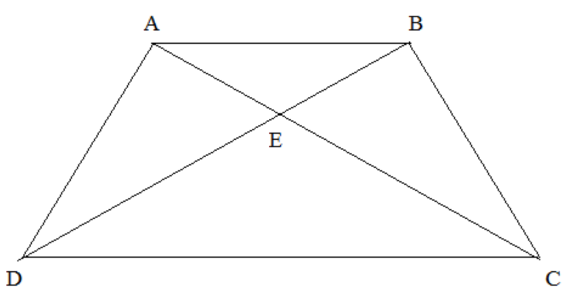
Statements	Reasons

9) Given: $\overline{AD} = \overline{BC}$

△ DEC is isosceles with base DC

△ ABE is isosceles with base AB

Prove: ∠ADC ≅ ∠BCD



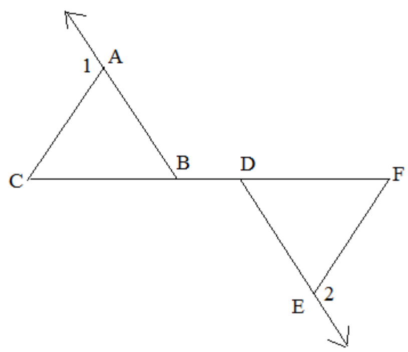
Statements	Reasons

10) Given: $\overline{AB} \parallel \overline{DE}$

$\overline{AB} \cong \overline{DE}$

$\angle 1 \cong \angle 2$

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

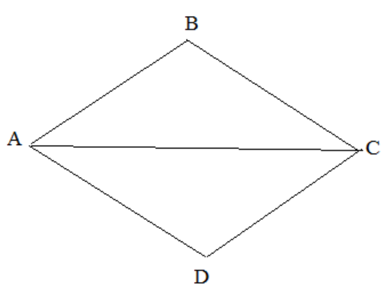


Statements	Reasons

11) Given: $\overline{AB} = \overline{CD}$

$\overline{BC} = \overline{AD}$

Prove $\overline{AB} \parallel \overline{CD}$

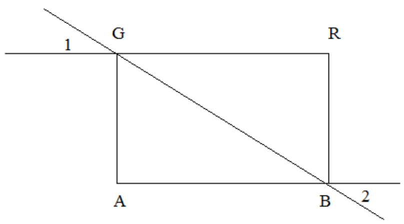


Statements	Reasons

12) Given: $\angle 1 = \angle 2$

$\overline{GR} = \overline{AB}$

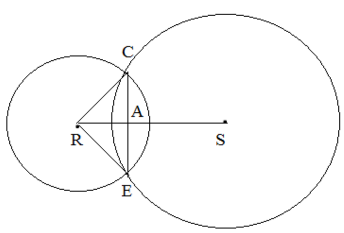
Prove: $\angle R = \angle A$



Statements	Reasons

13) Given: $\odot R$ and $\odot S$

Prove: $\overline{RA}$ bisects $\angle CRE$



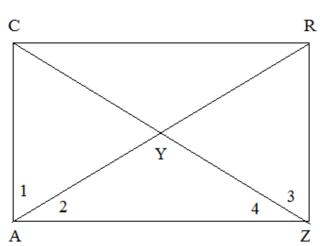
Statements	Reasons

14) Given: $\overline{CA}$ is an altitude of $\triangle CAZ$

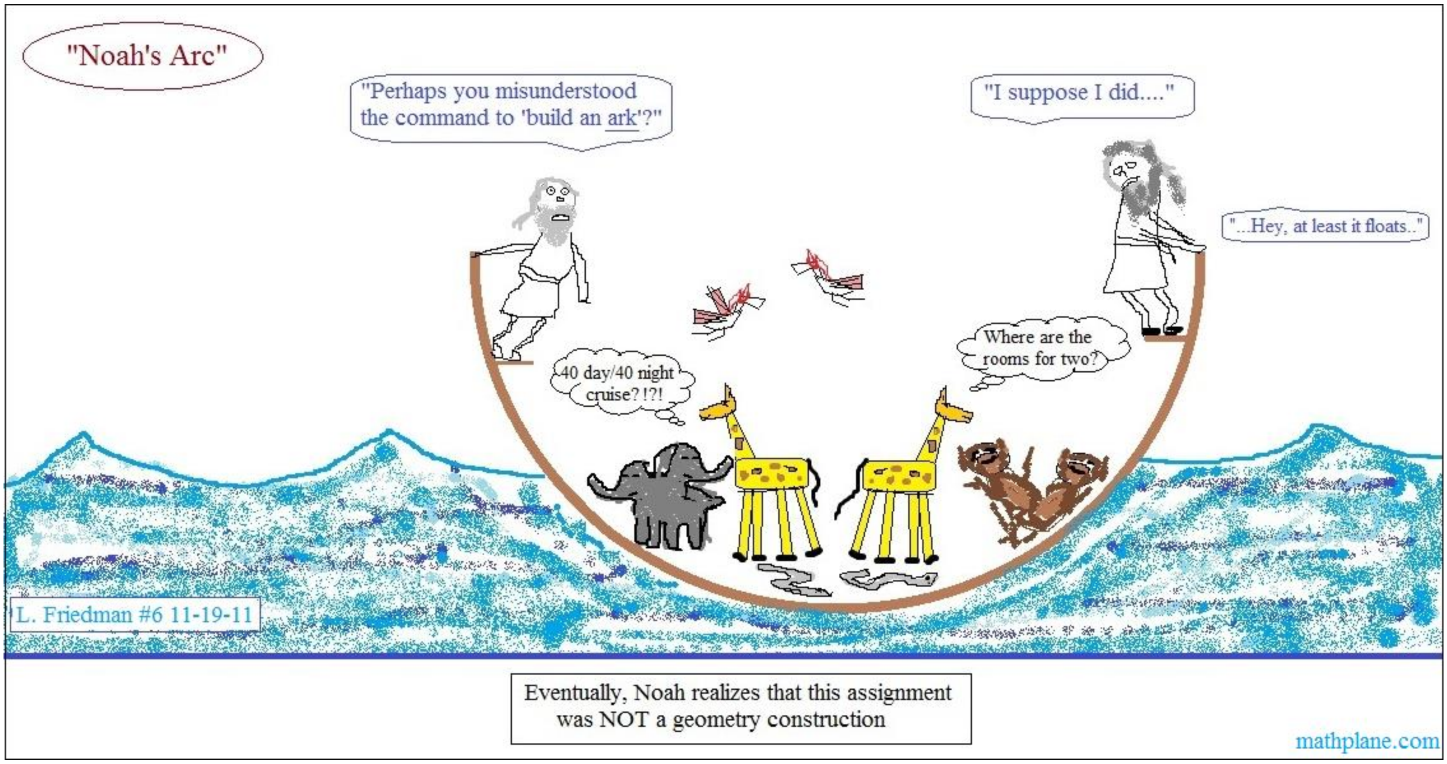
$\overline{RZ}$ is an altitude of $\triangle RZA$

$\overline{CA} = \overline{RZ}$

Prove: $\angle 1 = \angle 3$



Statements	Reasons

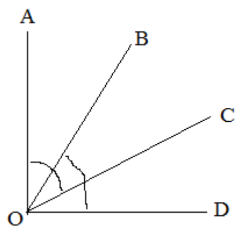

"Noah's Arc"
"Perhaps you misunderstood the command to 'build an ark'?"
"I suppose I did...."
"...Hey, at least it floats.."
40 day/40 night cruise? !?!
Where are the rooms for two?
L. Friedman #6 11-19-11
Eventually, Noah realizes that this assignment was NOT a geometry construction
mathplane.com

SOLUTIONS -→

Introduction to proofs: Identifying theorems and postulates

SOLUTIONS

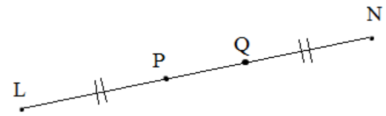
1) Why is $\angle AOB \cong \angle COD$?



Since AOC = BOD,
and BOC = BOC (reflexive property),
AOB = COD (subtraction property)

(If congruent angles are subtracted from congruent angles, then the differences are congruent)

2) Why are $\overline{LQ}$ and $\overline{PN}$ congruent segments?

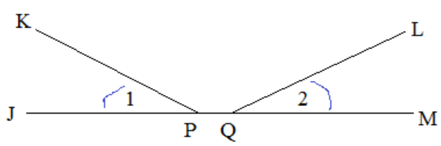


Since $\overline{LP} = \overline{QN}$,
and $\overline{PQ} = \overline{PQ}$ (reflexive property),

then $\overline{LQ}$ and $\overline{PN}$ are congruent (addition property)

(If congruent segments are added to equal segments, then the sums are the same!)

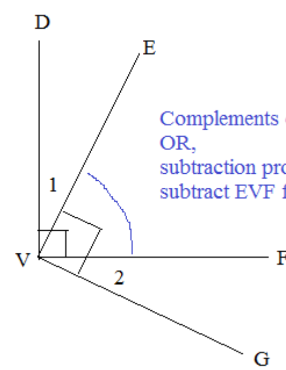
3) Angles 1 and 2 are congruent.
Why are $\angle KPM$ and $\angle LQJ$ congruent?



If angles are supplementary to congruent angles, then they are congruent..

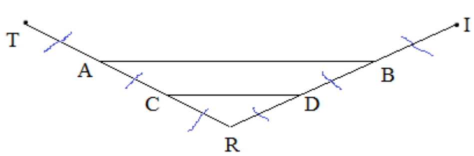
4) $DV \perp VF$ and $EV \perp VG$

Why is angle 1 congruent to angle 2?



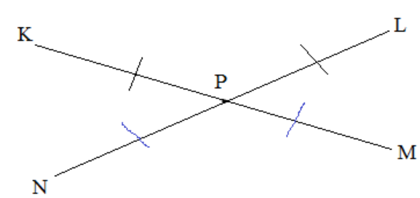
Complements of the same angle are congruent.
OR,
subtraction property (right angles are congruent... then, subtract EVF from each, leaving 1 and 2)

5) If TR = RI, and AB and CD are trisectors, why are CR and BD congruent segments?



Division Property (If equal segments are divided by the same amount, the divided amounts are congruent)

6) KM and LN bisect each other.
Is KM congruent to NL?



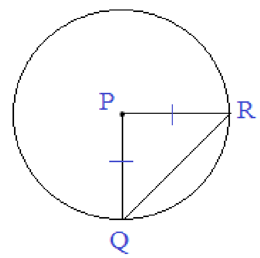
Yes... Since segments bisect each other, KP = PM and NP = PL.. Also, from diagram, KP = PL...
So, using substitution and addition properties, KM = NL
Or, use the multiplication property.. (Since KP = PL and both segments are doubled, the products are equal)

Introduction to proofs: Identifying geometry theorems and postulates

ANSWERS

Explain using geometry concepts and theorems:

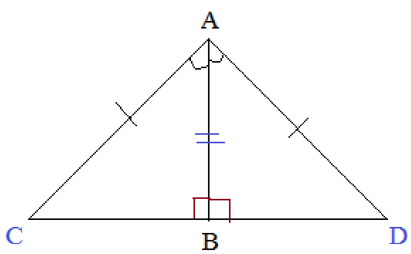
1) Why is the triangle isosceles?



$\overline{PR}$ and $\overline{PQ}$ are radii of the circle. Therefore, they have the same length.

A triangle with 2 sides of the same length is isosceles.

2) Why is $\overline{AB}$ an altitude?



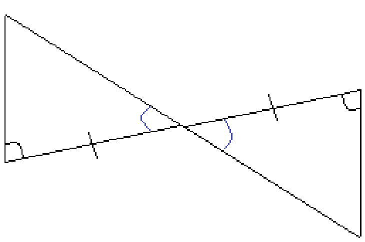
$\overline{AB} = \overline{AB}$ (reflexive)
therefore,
$\triangle CAB = \triangle DAB$
(side-angle-side)

If triangles are same, then
$\angle ABC = \angle ABD$
(CPCTC)

Since angles are same and must add up to 180, each is 90°

Therefore, $\overline{AB}$ is altitude.

3) Why are the triangles congruent?



Vertical angles are congruent
therefore,
triangles are congruent
(angle-side-angle)

4) Why is $\overline{NM}$ a median?

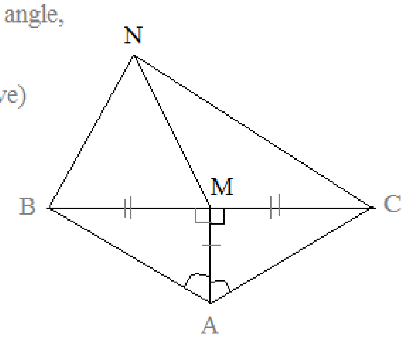
Since CMA is right angle,
AMB is right angle.

$\overline{AM} = \overline{AM}$ (reflexive)

$\triangle AMB = \triangle AMC$
(Angle-Side-Angle)

$\overline{BM} = \overline{CM}$
(CPCTC)

$\overline{NM}$ is a median
(segment from vertex to midpoint)



5) If ABCD is a parallelogram, why are $\angle A$ and $\angle C$ congruent?

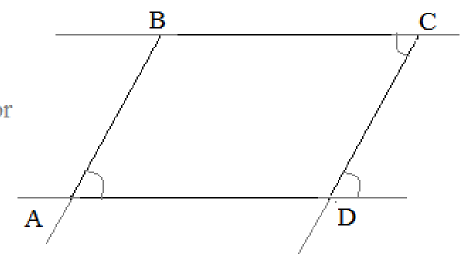
$\overline{BC} \parallel \overline{AD}$
(definition of a parallelogram)

$\angle C = \angle D$
(alternate interior angles)

$\overline{CD} \parallel \overline{AB}$
(def. of parallelogram)

$\angle A = \angle D$
(corresponding angles)

Since C = D and D = A, then A = C.

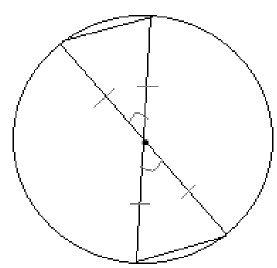


6) Why are the triangles congruent?

Since they are radii of the circle,
the 4 marked sides are congruent.

Vertical angles

Triangles congruent by
side-angle-side



NOTE: CPCTC is "Corresponding Parts of Congruent Triangles are Congruent"

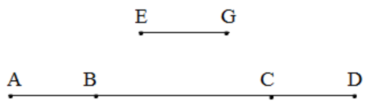
Geometry Proofs

SOLUTIONS

A) Given: $\overline{AB} \cong \overline{EG}$

$\overline{CD} \cong \overline{EG}$

Prove: $\overline{AC} \cong \overline{BD}$



Statements	Reasons
1) AB = EG	1) Given
2) CD = EG	2) Given
3) AB = CD	3) Transitive Property (Segments that are congruent to the same segment are congruent)
4) BC = BC	4) Reflexive Property
5) AC = BD	5) Addition Property (If a segment is added to congruent segments, the sums are congruent)

OR,

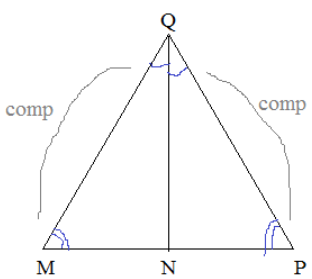
Statements	Reasons
1) AB = EG	1) Given
2) CD = EG	2) Given
3) AB = CD	3) Transitive Property (Segments that are congruent to the same segment are congruent)
4) AC = BD	4) Addition Property (If segment (BC) is added to congruent segments, then the sums are congruent)

B) Given: $\angle M$ is the complement to $\angle MQN$

$\angle P$ is the complement to $\angle PQN$

$\overline{NQ}$ bisects $\angle MQP$

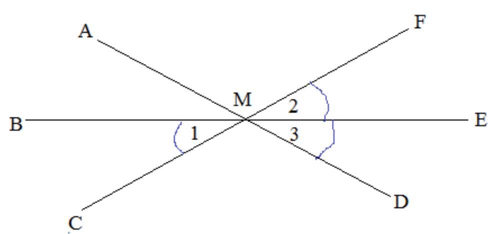
Prove: $\angle M \cong \angle P$



Statements	Reasons
1) $\overline{NQ}$ bisects $\angle$ MQP	1) Given
2) $\angle$MQN $\cong$ $\angle$PQN	2) Definition of (Angle) Bisector (If ray bisects an angle, the angle halves are congruent)
3) Angles M and MQN are complementary	3) Given
4) Angles P and PQN are complementary	4) Given
5) $\angle$M = $\angle$P	5) Substitution (If angles are complementary to congruent angles, then they are congruent) "Congruent Complements"

C) Given: $\overline{BE}$ bisects $\angle$ FMD

Prove: $\angle 1 \cong \angle 3$



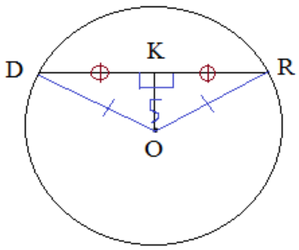
Statements	Reasons
1) $\overline{BE}$ bisects $\angle$FMD	1) Given
2) $\angle$ 2 = $\angle$3	2) Definition of Bisector (If segment bisects an angle, the angle halves are congruent)
3) $\angle$1 = $\angle$2	3) Vertical angles are congruent
4) $\angle$1 = $\angle$3	4) Transitive Property (Angles congruent to the same angle are congruent)

Geometry Proofs

SOLUTIONS

1) Given: $\odot O$; $\overline{DR} \perp \overline{OK}$

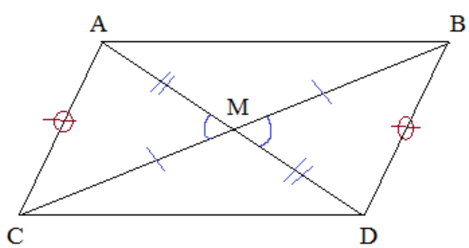
Prove: $\overline{DK} \cong \overline{KR}$



Statements	Reasons
1. Circle O	1. Given
2. $\overline{DR} \perp \overline{OK}$	2. Given
3. $\angle$ OKD and $\angle$ OKR are right angles	3. Definition of perpendicular
4. $\angle$ OKD $\cong$ $\angle$ OKR	4. All right angles are congruent
5. Auxilary line segments $\overline{OR}$ and $\overline{OD}$	5. A segment joins 2 points
6. $\overline{OR} \cong \overline{OD}$	6. All radii are congruent
7. $\overline{OK} \cong \overline{OK}$	7. Reflexive property
8. $\triangle$DOK = $\triangle$ ROK	8. Hypotenuse Leg Theorem (HL) (4, 6, 7)
9. $\overline{DK} \cong \overline{KR}$	9. CPCTC

2) Given: $\overline{AD}$ and $\overline{BC}$ bisect each other

Prove: $\overline{AC} \cong \overline{BD}$

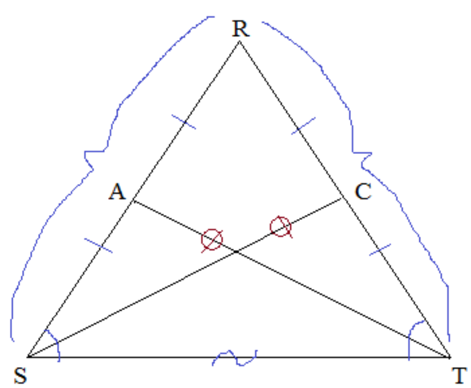


Statements	Reasons
1. $\overline{AD}$ and $\overline{BC}$ bisect each other	1. Given
2. $\overline{AM} \cong \overline{DM}$; $\overline{CM} \cong \overline{BM}$	2. Definition of bisector
3. $\angle$AMC $\cong$ $\angle$BMD	3. Vertical angles are congruent
4. $\triangle$AMC $\cong$ $\triangle$ DMB	4. Side-Angle-Side (SAS) (2, 3, 2)
5. $\overline{AC} \cong \overline{BD}$	5. CPCTC (Corresponding Parts of Congruent Triangles are Congruent)

3) Given: $\overline{RS} \cong \overline{RT}$

$\overline{AT}$ and $\overline{CS}$ are medians

Prove: $\overline{AT}$ and $\overline{CS}$ are congruent



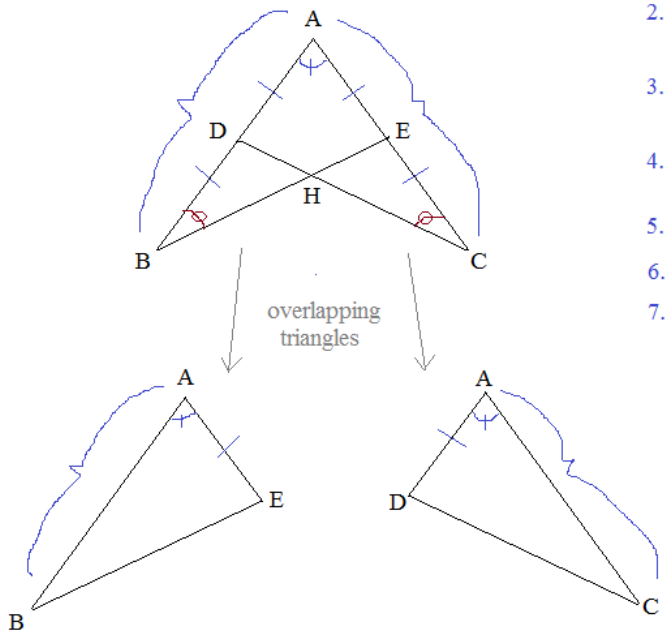
Statements	Reasons
1. $\overline{RS} \cong \overline{RT}$	1. Given
2. $\angle$ RST $\cong$ $\angle$RTS	2. Sides-Angles Theorem (Isosceles Triangle)
3. $\overline{AT}$ and $\overline{CS}$ are medians	3. Given
4. A and C are midpoints	4. Definition of median
5. $\overline{RA} \cong \overline{SA}$; $\overline{RC} \cong \overline{TC}$	5. Definition of midpoint
6. $\overline{SA} \cong \overline{CT}$	6. Division property (like division of congruent segments)
7. $\overline{ST} \cong \overline{ST}$	7. Reflexive property
8. $\triangle$SAT $\cong$ $\triangle$TCS	8. Side-Angle-Side (SAS) (6, 2, 7)
9. $\overline{AT} \cong \overline{CS}$	9. CPCTC

Geometry Proofs

SOLUTIONS

4) Given: $\overline{AC} \cong \overline{AB}$
D and E are midpoints

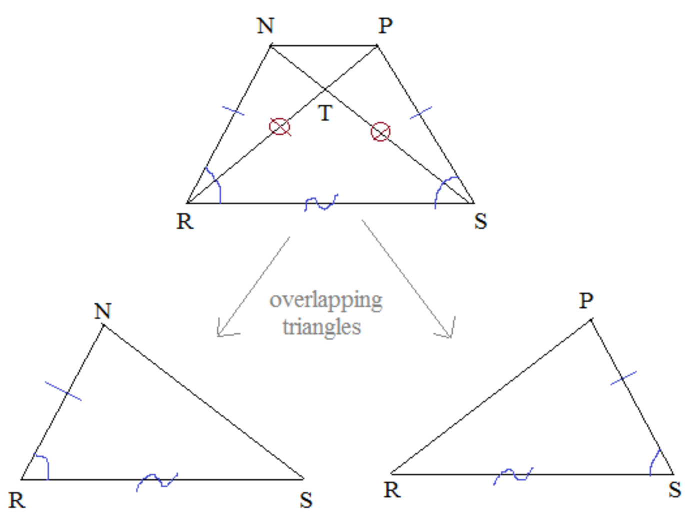
Prove: $\angle B \cong \angle C$



Statements	Reasons
1. $\overline{AC} \cong \overline{AB}$	1. Given
2. $\overline{AE} \cong \overline{EC}$ (AE is 1/2 of AC)	2. Definition of midpoint
3. $\overline{AD} \cong \overline{DB}$ (AD is 1/2 of AB)	3. Definition of midpoint
4. $\overline{AD} \cong \overline{AE}$	4. Division property ("like division" of congruent segments)
5. $\angle A \cong \angle A$	5. Reflexive property
6. $\triangle DAC \cong \triangle EAB$	6. Side-Angle-Side (SAS) (4, 5, 1)
7. $\angle B \cong \angle C$	7. CPCTC

5) Prove the diagonals of an isosceles trapezoid are congruent.

Definition of Isosceles Trapezoid: A trapezoid in which the base angles and <u>non-parallel</u> sides are congruent



Statements	Reasons
1. RNPS is isosceles trapezoid with base RS	1. Given (diagram)
2. $\overline{NR} \cong \overline{PS}$	2. Definition of Isosceles Trapezoid
3. $\angle NRS \cong \angle PSR$	3. Definition of Isosceles Trapezoid
4. $\overline{RS} \cong \overline{RS}$	4. Reflexive property
5. $\triangle NRS \cong \triangle PSR$	5. Side-Angle-Side (SAS) (2, 3, 4)
6. (diagonals) $\overline{PR} \cong \overline{NS}$	6. CPCTC

Geometry Proofs

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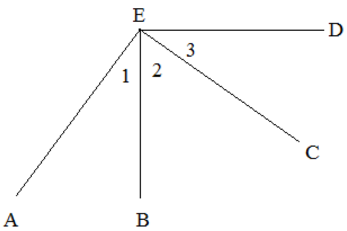
6) Given: $\overline{AE} \perp \overline{EC}$

$\overline{BE} \perp \overline{ED}$

Prove: $\angle 1 = \angle 3$



Proof 1: Using the Subtraction Property

Statements	Reasons
1) $\overline{AE} \perp \overline{EC}$	1) Given
2) $\overline{BE} \perp \overline{ED}$	2) Given
3) $\angle$AEC is right angle	3) Definition of Perpendicular (Perpendicular lines form right angles)
4) $\angle$BED is right angle	4) Definition of Perpendicular
5) $\angle AEC \cong \angle BED$	5) All right angles are congruent
6) $\angle 2 \cong \angle 2$	6) Reflexive property
7) $\angle 1 \cong \angle 3$	7) Subtraction property (If equal angles are subtracted from congruent angles, then the differences are congruent)

Proof 2: Using the Congruent Complements

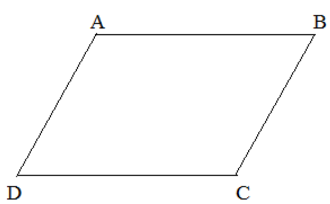
Statements	Reasons
1) $\overline{AE} \perp \overline{EC}$	1) Given
2) $\overline{BE} \perp \overline{ED}$	2) Given
3) $\angle$AEC is right angle	3) Definition of Perpendicular (Perpendicular lines form right angles)
4) $\angle$BED is right angle	4) Definition of Perpendicular
5) Angles 1 and 2 are complementary	5) Definition of complementary (Two angles that add up to 90 degrees i.e. form a right angle)
6) Angles 3 and 2 are complementary	6) Definition of Complementary
7) $\angle 1 \cong \angle 3$	7) Congruent Complements (Complements of the same angle are congruent)

7) Given: $\overline{AB} \parallel \overline{CD}$

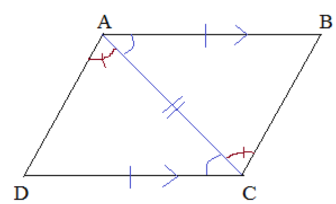
$\overline{AB} \cong \overline{CD}$

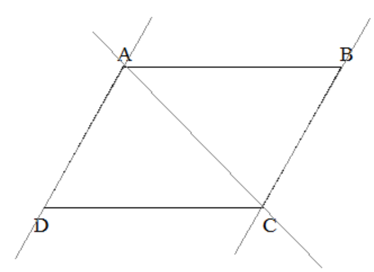
Prove: $\overline{AD} \parallel \overline{BC}$

(Hint: Use an auxilary line segment)



Statements	Reasons
1) $\overline{AB} = \overline{CD}$	1) Given
2) $\overline{AC}$ is a line segment	2) Auxilary line (2 points make a line)
3) $\overline{AB} \parallel \overline{CD}$	3) Given
4) $\angle BAC = \angle DCA$	4) If $\parallel$ lines cut by transversal, then alternate interior angles congruent
5) $\overline{AC} \cong \overline{AC}$	5) Reflexive Property
6) $\triangle BAC \cong \triangle DCA$	6) Side-Angle-Side (SAS) (1, 4, 5)
7) $\angle ACB = \angle CAD$	7) Corresponding Parts of Congruent Triangles are Congruent (CPCTC)
8) $\overline{AD} \parallel \overline{BC}$	8) If alternate interior angles are congruent, then lines are parallel





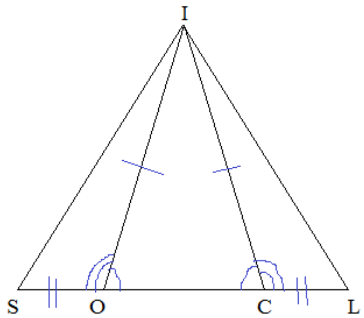
Geometry Proofs

SOLUTIONS

8) Given: △ OIC is an isosceles triangle (with base OC)

$\overline{SO} \cong \overline{CL}$

Prove: △ ISL is an isosceles triangle



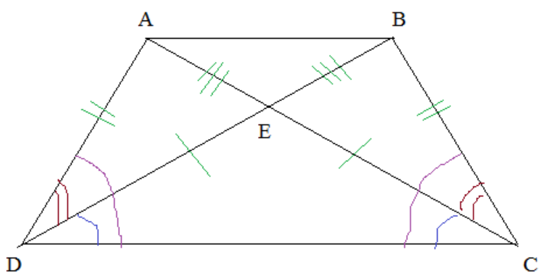
Statements	Reasons
1) OIC is an isosceles triangle with base $\overline{OC}$	1) Given
2) $\overline{IO} = \overline{IC}$	2) Definition of isosceles (2 congruent sides)
3) $\overline{SO} = \overline{CL}$	3) Given
4) ∠IOC = ∠ICO	4) If congruent sides (in triangle), then congruent angles.. (or, base angles of isosceles triangle are congruent)
5) ∠IOS is supp. to ∠IOC ∠ICL is supp. to ∠ICO	5) If adjacent angles form a straight angle, then angles are supplementary
6) ∠IOS = ∠ICL	6) If 2 angles are supplementary to congruent angles, then the 2 angles are congruent
7) △IOS = △ICL	7) Side-Angle-Side (2, 6, 3)
8) ∠S = ∠L	8) CPCTC (corresponding parts of congruent triangles are congruent)
9) △ ISL is isosceles	9) If base angles of triangle are congruent, then triangle is isosceles

9) Given: $\overline{AD} = \overline{BC}$

△DEC is isosceles with base DC

△ABE is isosceles with base AB

Prove: ∠ADC ≅ ∠BCD



Statements	Reasons
1) $\overline{AD} = \overline{BC}$	1) Given
2) △DEC is isosceles	2) Given
3) ∠EDC = ∠ECD	3) Base angles of isoseces triangle are congruent
4) $\overline{DE} = \overline{EC}$	4) If congruent angles (in triangle), then congruent sides.. (or, use def. of isoseles triangle -- 2 congruent sides)
5) △ABE is isosceles	5) Given
6) $\overline{AE} = \overline{BE}$	6) Definition of Isosceles (if isos., then at least 2 sides congruent)
7) △AED = △BEC	7) Side-Side-Side (6, 4, 1)
8) ∠ADE = ∠BCE	8) CPCTC (corresponding parts of congruent triangles are congruent)
9) ∠ADC = ∠BCD	9) Additional property (if 2 congruent angles are added to congruent angles, then the sums are congruent)

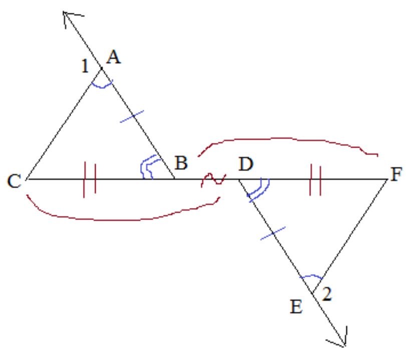
10) Given: $\overline{AB} \parallel \overline{DE}$

$\overline{AB} \cong \overline{DE}$

$\angle 1 \cong \angle 2$

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

Strategy: use the given statements to help prove that the triangles are congruent.. Then, use sides in triangles to ultimately get congruent segments...

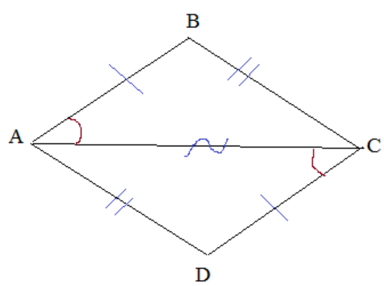


Statements	Reasons
1) $\overline{AB} \cong \overline{DE}$	1) Given
2) $\angle 1 \cong \angle 2$	2) Given
3) $\angle 1$ and $\angle BAC$ are supplementary $\angle 2$ and $\angle DEF$ are supplementary	3) Definition of supplementary angles (adjacent angles that form straight angle)
4) $\angle BAC \cong \angle DEF$	4) Congruent supplements (If angles are supplementary to congruent angles, then they are congruent.)
5) AB ∥ DE	5) Given
6) $\angle ABC \cong \angle EDF$	6) If parallel lines cut by transversal, then alternate exterior angles are congruent
7) $\triangle ABC \cong \triangle EDF$	7) ASA (Angle-Side-Angle) 4, 1, 6
8) $\overline{CB} \cong \overline{FD}$	8) CPCTC (Corresponding Parts of Congruent Triangles are Congruent)
9) $\overline{BD} \cong \overline{BD}$	9) Reflexive Property
10) $\overline{CD} \cong \overline{FB}$	10) Addition Property (If segment (BD) is added to congruent segments, then the sums are congruent)

11) Given: $\overline{AB} = \overline{CD}$

$\overline{BC} = \overline{AD}$

Prove $\overline{AB} \parallel \overline{CD}$



Statements	Reasons
1) $\overline{AB} = \overline{CD}$	1) Given
2) $\overline{BC} = \overline{AD}$	2) Given
3) $\overline{AC} = \overline{AC}$	3) Reflexive Property
4) $\triangle ABC = \triangle CDA$	4) SSS (Side-Side-Side)
5) $\angle BAC = \angle DCA$	5) CPCTC (Corresponding Parts of Congruent Triangles are Congruent)
6) $\overline{AB} \parallel \overline{CD}$	6) If alternate interior angles are congruent, then the lines are parallel

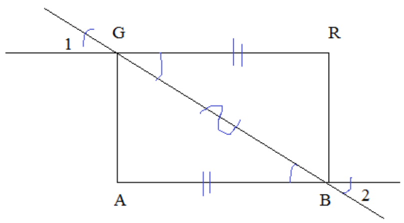
Note: angles DAC and BCA are irrelevant, because they would prove BC ∥ AD

12) Given: ∠1 = ∠2

$\overline{GR} = \overline{AB}$

Prove: ∠R = ∠A

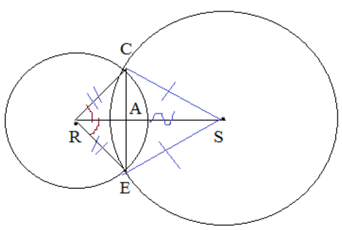
SOLUTIONS



Statements	Reasons
1) ∠1 = ∠2	1) Given
2) ∠1 = ∠ RGB	2) Vertical Angles Congruent
3) ∠2 = ∠ ABG	3) Vertical Angles Congruent
4) ∠ ABG = ∠ RGB	4) Transitive Property (If angles congruent to congruent angles, then the angles are congruent to each other)
5) $\overline{GR} = \overline{AB}$	5) Given
6) $\overline{GB} = \overline{GB}$	6) Reflexive Property
7) △ABG = △RGB	7) Side-Angle-Side (SAS) (5, 4, 6)
8) ∠R = ∠A	8) Corresponding Parts of Congruent Triangles are Congruent (CPCTC)

13) Given: ⊙R and ⊙S

Prove: $\overline{RA}$ bisects ∠CRE



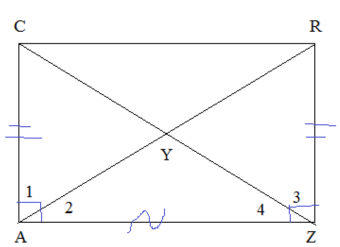
Statements	Reasons
1) Circles R and S	1) Given
2) $\overline{CR} = \overline{ER}$	2) All Radii Congruent
3) Draw auxiliary line segments $\overline{CS}$ and $\overline{ES}$	3) A segment joins 2 points
4) $\overline{CS} = \overline{ES}$	4) All Radii Congruent
5) $\overline{RS} = \overline{RS}$	5) Reflexive Property
6) △CRS = △ERS	6) Side-Side-Side (SSS) (2, 5, 4)
7) △ABG = △RGB	7) Corresponding Parts of Congruent Triangles are Congruent (CPCTC)
8) $\overline{RA}$ bisects ∠CRE	8) Definition of Bisector (If a segment divides an angle into equal halves, then it is a bisector)

14) Given: $\overline{CA}$ is an altitude of △CAZ

$\overline{RZ}$ is an altitude of △RZA

$\overline{CA} = \overline{RZ}$

Prove: ∠1 = ∠3



Statements	Reasons
1) $\overline{CA}$ is altitude △ CZA $\overline{RZ}$ is altitude △ RZA	1) Given
2) CAZ and RZA are right angles	2) Definition of Altitude (Altitude forms right angle)
3) ∠ CAZ = ∠RZA	3) All right angles are congruent
4) $\overline{CA} = \overline{RZ}$	4) Given
5) $\overline{AZ} = \overline{AZ}$	5) Reflexive Property
6) △CAZ = △RZA	6) Side-Angle-Side (SAS) (4, 3, 5)
7) ∠2 = ∠4	7) Corresponding Parts of Congruent Triangles are Congruent (CPCTC)
8) angle 1 comp. to angle 2 angle 3 comp. to angle 4	8) Definition of Complementary (If 2 adjacent angles form a right angle, then angles are complementary)
9) ∠1 = ∠3	9) substitution (if angles are complementary to congruent angles then the angles are congruent.)

Thanks for visiting. (Hope it helped!)

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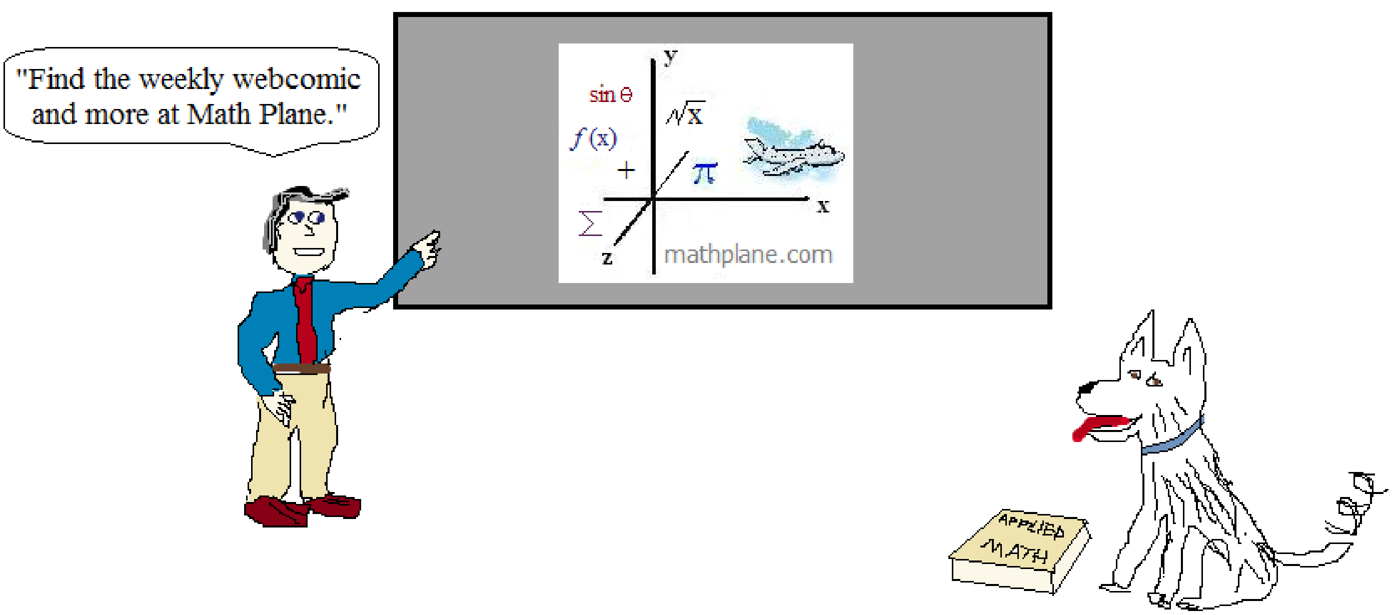
If you have questions, suggestions, or requests, let us know.



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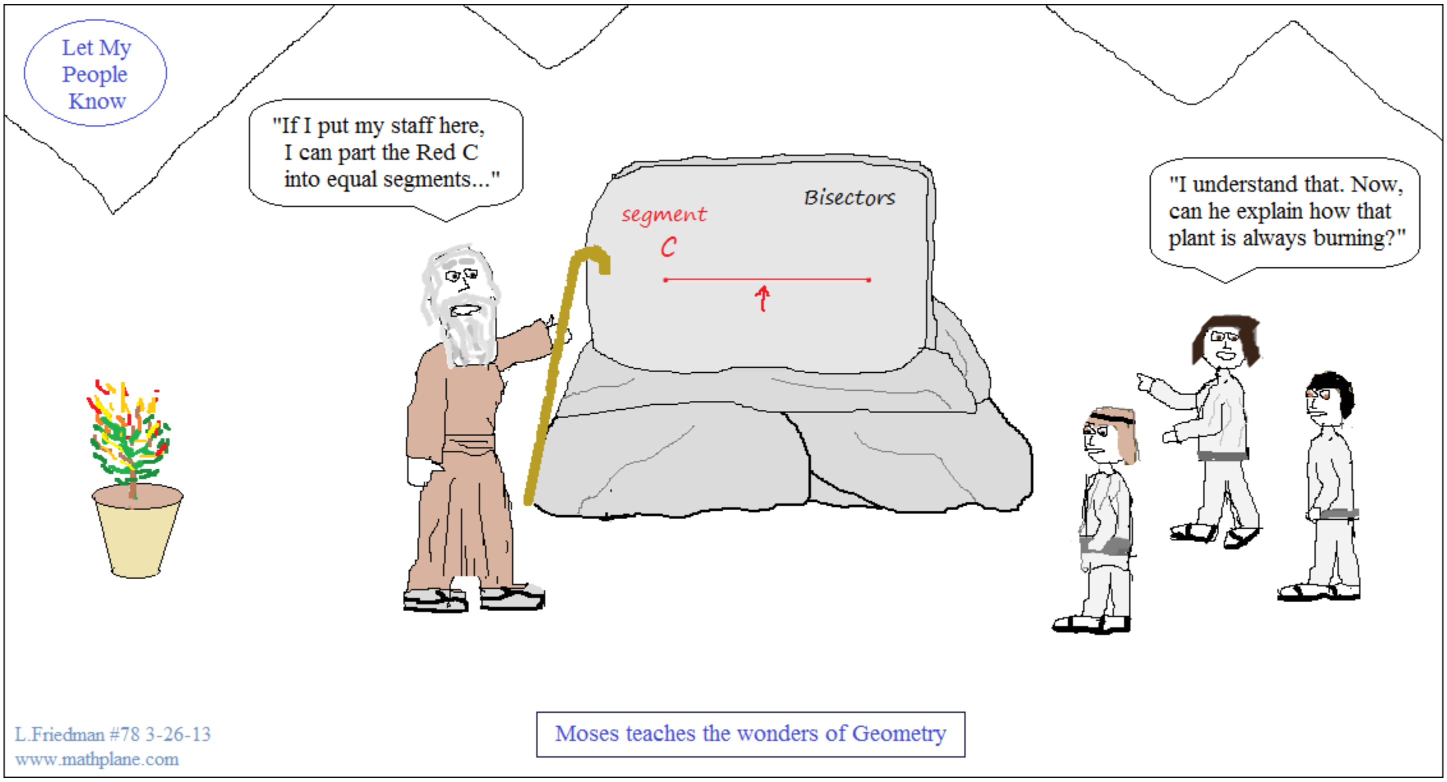
Let My People Know
"If I put my staff here, I can part the Red C into equal segments..."
segment C
Bisectors
"I understand that. Now, can he explain how that plant is always burning?"
L.Friedman #78 3-26-13
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