2.2 Proof Properties

Memorize these ASAP!

Properties of Equality

Addition Property of Equality:

_____

Subtraction Property of Equality:

_____

Multiplication Prop. of Equality:

_____

Division Property of Equality:

_____

Substitution Property of Equality:

_____

Reflexive Prop. of Equality:

_____

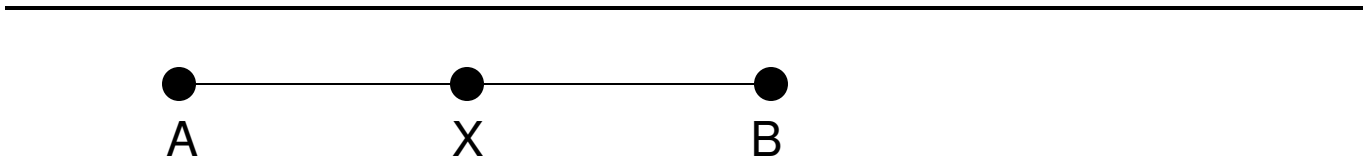
Symetric Prop. of Equality:

_____

Transitive Property of Equality:

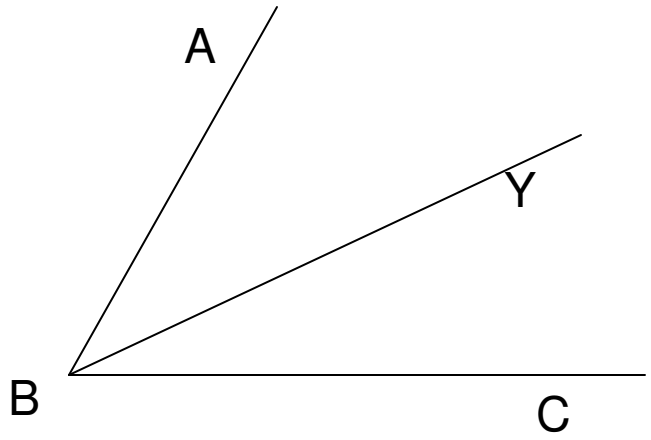
Definition of Congruence:

Definition of a Midpoint:



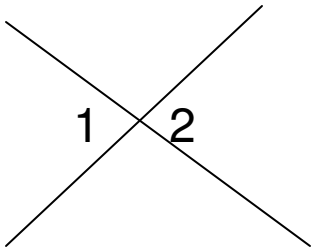
Midpoint Theorem:

Definition of Angle Bisector:

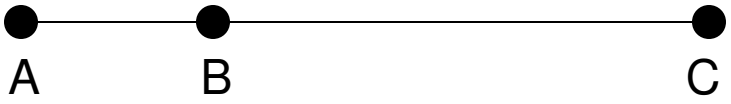


Angle Bisector Theorem:

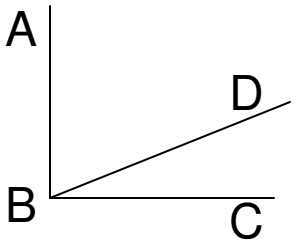
Vertal Angle Theorem (VAT):



Segment Addition Postulate (SAP):



Angle Addition Postulate (AAP):



Proof- _____

_____

We will now use all the theorems, postulates and properties we just defined to solve proofs.

Lets try a Algebra Proof first.

Given: $4x+3 = 2x -9$

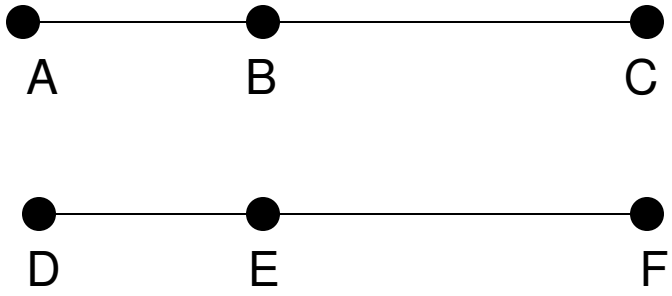
Prove: $x= -6$

Given always first statement and reason!

Statements	Reasons

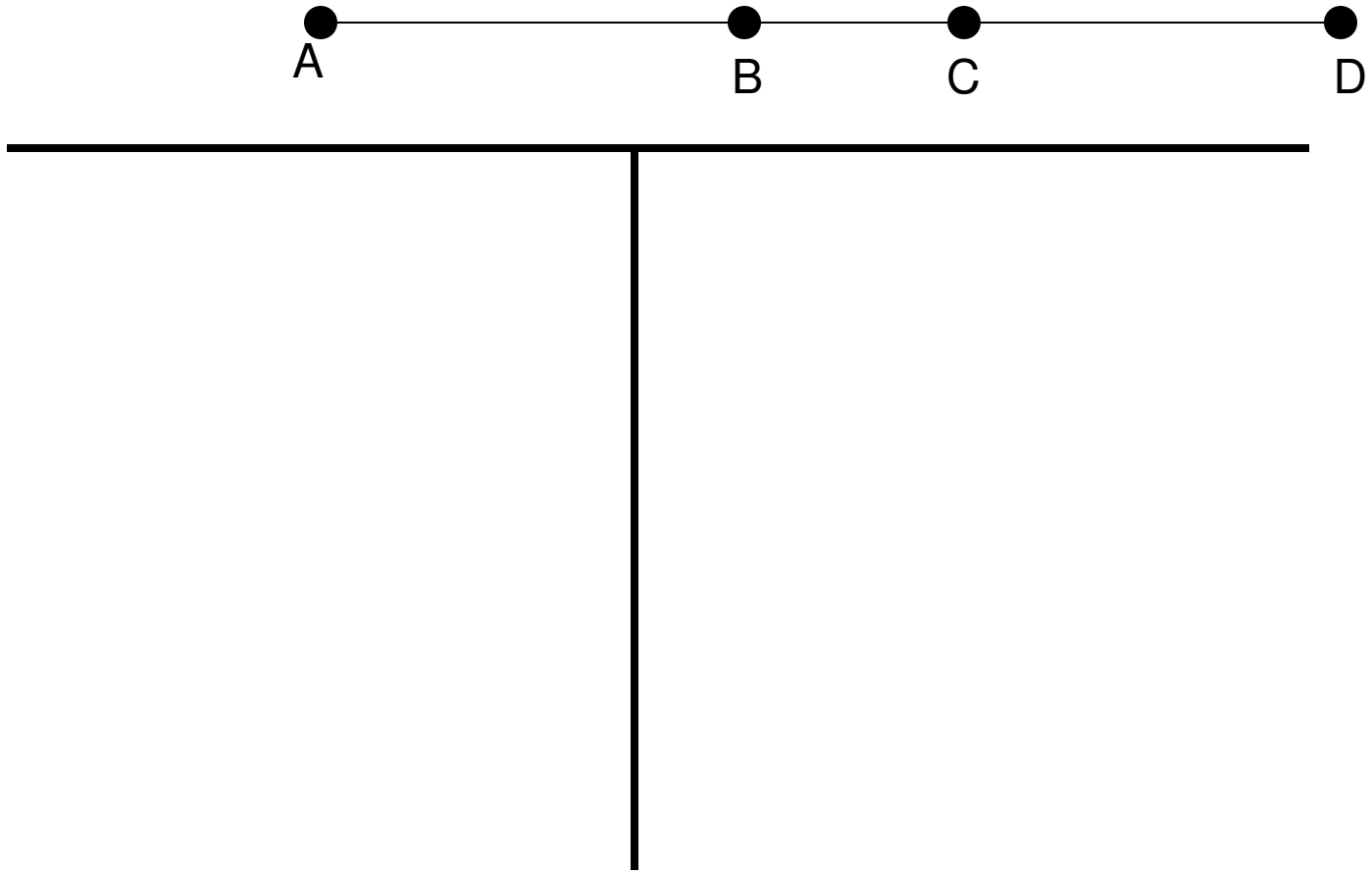
Given : $\overline{AB} \cong \overline{DE}$; $\overline{BC} \cong \overline{EF}$

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



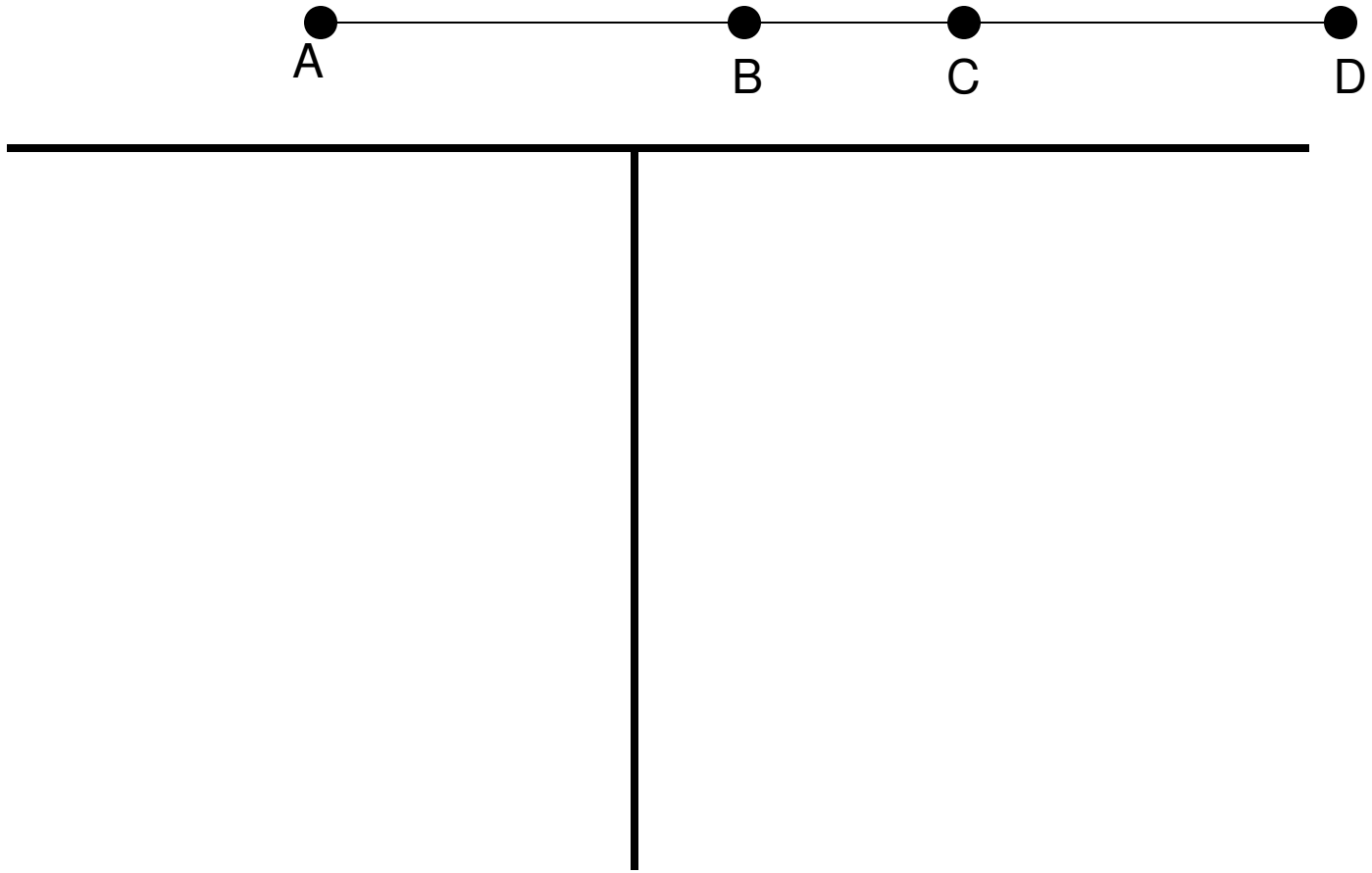
$Given: \overline{AB} \cong \overline{CD}$

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



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

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



Have we noticed a pattern?

Parts to Whole (given pieces, asked to prove whole)

- _____
- _____
- _____

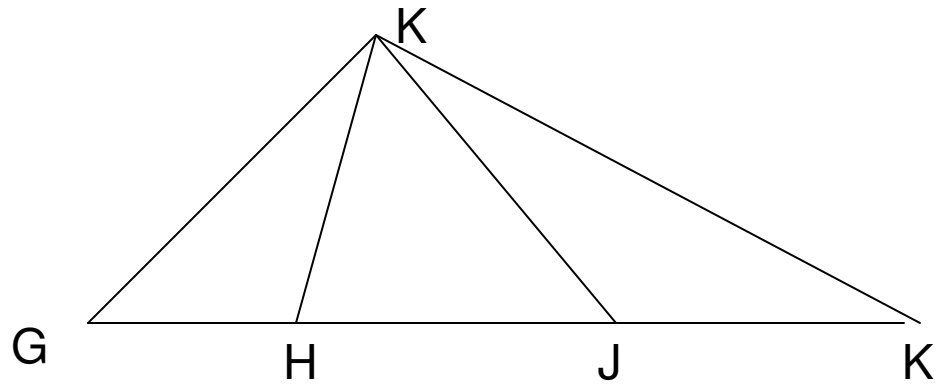
Whole to Parts (given Whole, asked to prove parts)

- _____
- _____
- _____

2.2 Proofs Continued

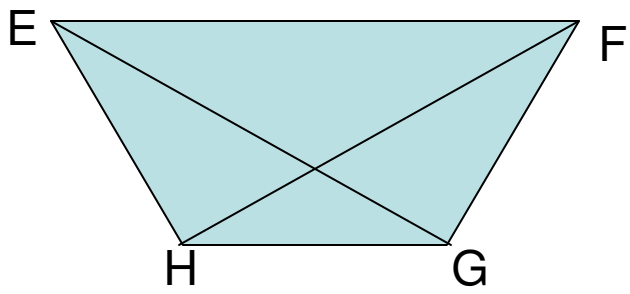
$Given: \overline{GJ} \cong \overline{HK}$

Prove: $\overline{GH} \cong \overline{JK}$



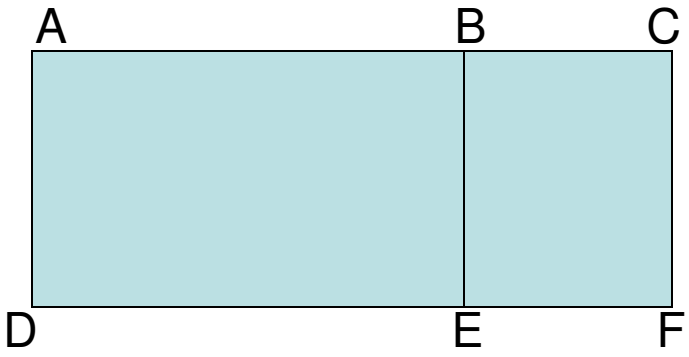
Given : $\measuredangle GHF \cong \measuredangle HGE; \measuredangle FHE \cong \measuredangle EGF$

Prove : $\measuredangle GHE \cong \measuredangle HGF$



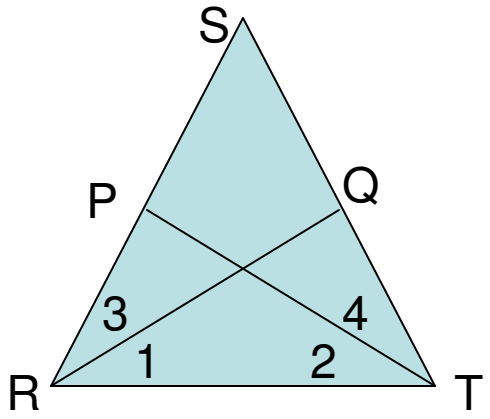
$Given: \overline{AC} \cong \overline{DF}; \overline{AB} \cong \overline{DE}$

Prove: $\overline{BC} \cong \overline{EF}$



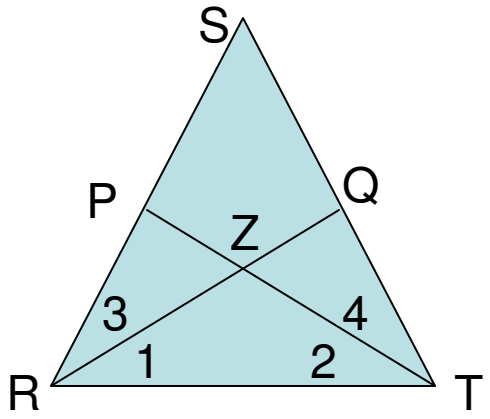
Given : $\measuredangle 1 \cong \measuredangle 2; \measuredangle 3 \cong \measuredangle 4$

Prove : $\measuredangle SRT \cong \measuredangle STR$



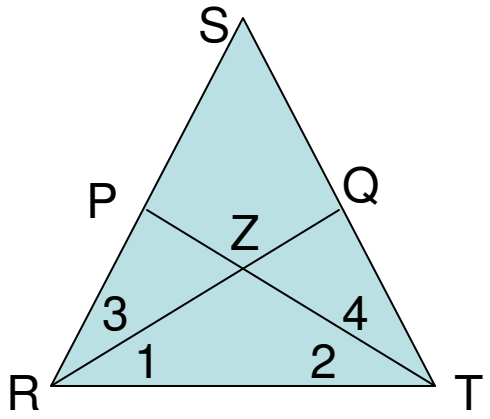
$Given: \overline{RP} \cong \overline{TQ}; \overline{PS} \cong \overline{QS}$

Prove: $\overline{RS} \cong \overline{TS}$



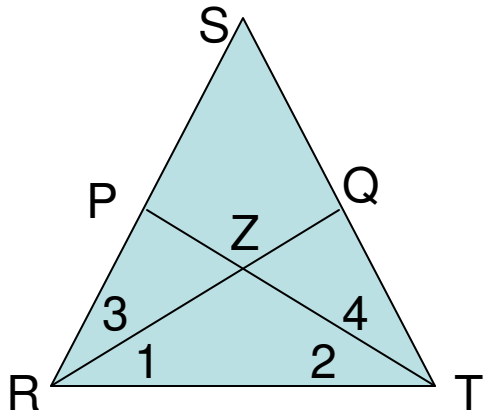
$Given: \overline{RQ} \cong \overline{TP}; \overline{ZQ} \cong \overline{ZP}$

$\text{Prove}: \overline{RZ} \cong \overline{TZ}$



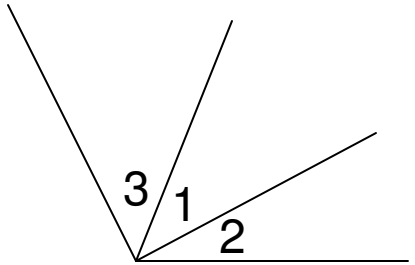
Given : $\measuredangle SRT \cong \measuredangle STR; \measuredangle 3 \cong \measuredangle 4$

Prove : $\measuredangle 1 \cong \measuredangle 2$



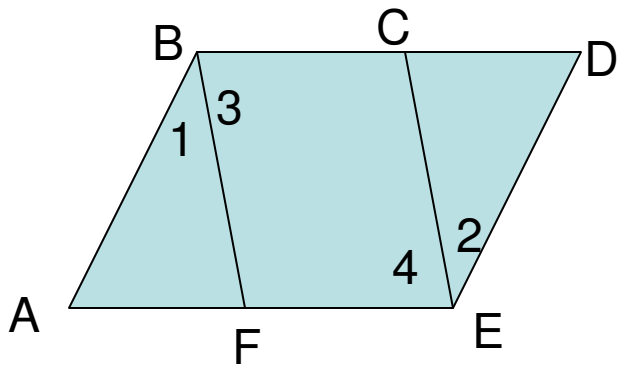
Given : $m\measuredangle 1 + m\measuredangle 2 = 90;\ \measuredangle 2 \cong \measuredangle 3$

Prove : $m\measuredangle 1 + m\measuredangle 3 = 90$



Given : $\measuredangle ABD \cong \measuredangle DEA; \measuredangle 1 \cong \measuredangle 2$

Prove : $\measuredangle 3 \cong \measuredangle 4$

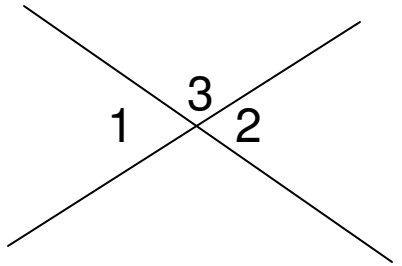


2.4 Vertical Angle Theorem

Lets Prove VAT

Given : *None*

Prove : $m\angle 1 = m\angle 2$



VAT- _____

_____

_____

_____

Supplement and Complement:

$m\angle T = 40$	Supp=	Comp=
$m\angle T = 1$	Supp=	Comp=
$m\angle T = 4x$	Supp=	Comp=

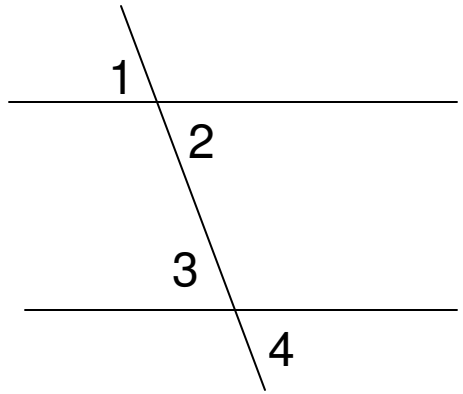
Complete with Always, Sometimes or Never

1. Vertical angles_____ have a common vertex?
2. 2 right angles are _____complementary.
3. Right angles are _____ vertical angles.
4. Vertical angles_____ have a common supplement.

Lets Prove VAT

$Given: m\angle 2 = m\angle 3$

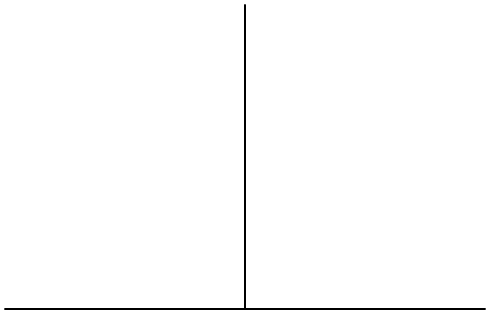
$\text{Prove}: m\angle 1 = m\angle 4$



2.5 Perpendicular Lines

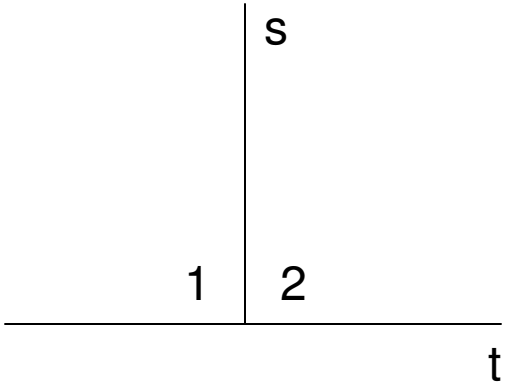
Definition of Perpendicular Lines:

- _____



- _____

Theorem 2-4:

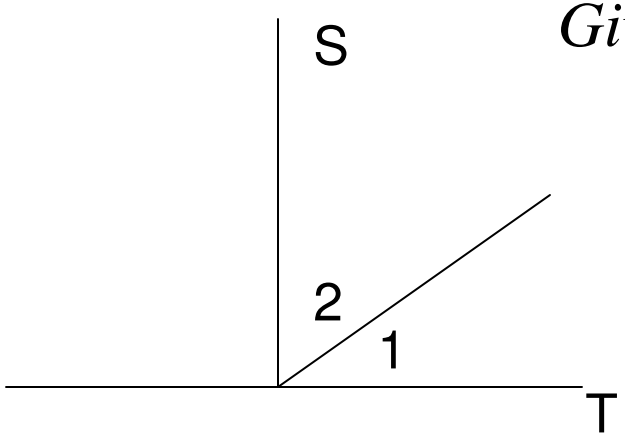


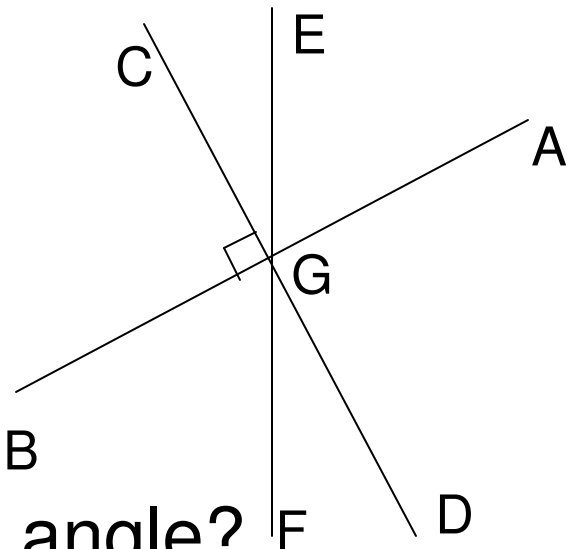
Definition of Complementary Angles

Definition of Supplementary Angles

Exterior Sides Theorem (EST):

$Given: S \text{ and } T \text{ are } \perp$





<u>True or False:</u>

1. Angle CGB is a right angle?
2. Angle CGA is a right angle?
3. Angle DGB is 90 degrees?
4. EGC and EGA are compliments?
5. DGF is complementary to DGA?
6. EGA is complementary to DGF

2.6 SAT and CAT

Supplementary Angle Theorem (SAT)

Example: If 1 is supp to 2 and 2 is sup to 3

Then SAT says

Complementary Angle Theorem (CAT)

Example: If 1 is comp to 2 and 2 is comp to 3

Then CAT says

When to use?

- _____

_____

- _____

_____

- _____

_____

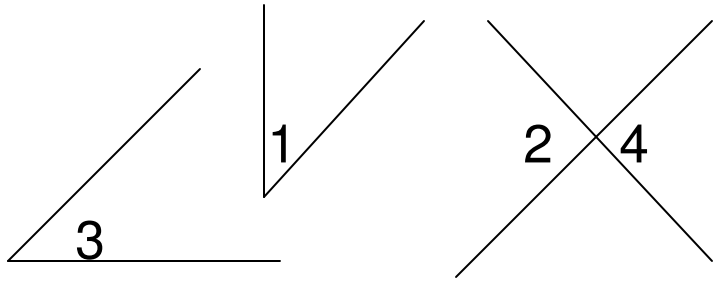
- _____

_____

Given : $\measuredangle 1$ is supp to $\measuredangle 2$;

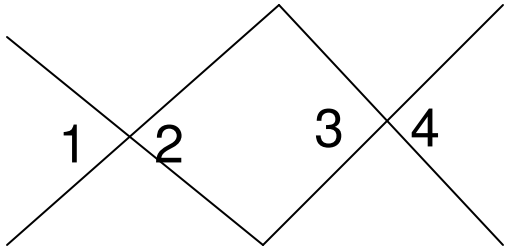
$\measuredangle 3$ is supp to $\measuredangle 4$

Prove : $\measuredangle 1 \cong \measuredangle 3$



Given : $\measuredangle 2 \cong \measuredangle 3$

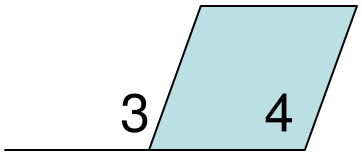
Prove : $\measuredangle 1 \cong \measuredangle 4$

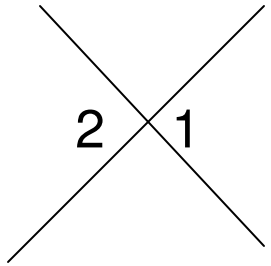


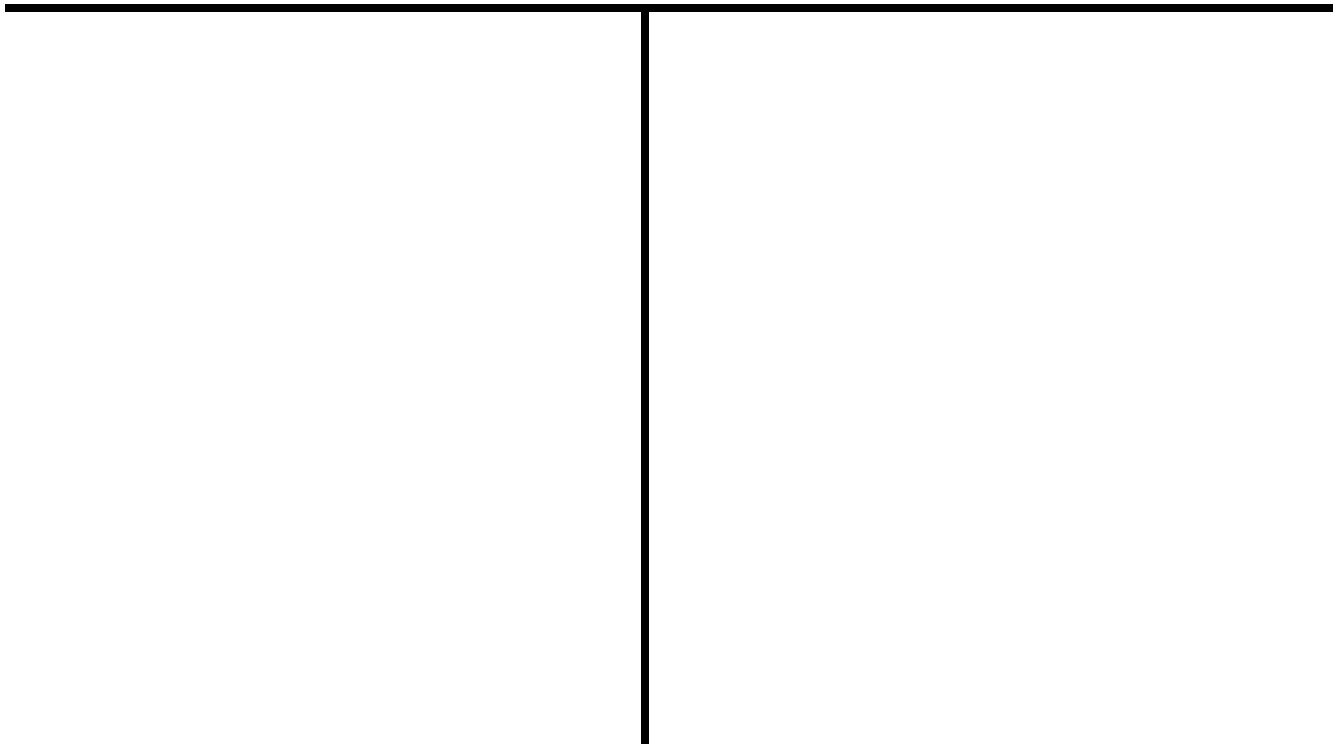
Given : $\measuredangle 3$ is supp to $\measuredangle 1$;

$\measuredangle 4$ is supp to $\measuredangle 2$

Prove : $\measuredangle 4 \cong \measuredangle 3$



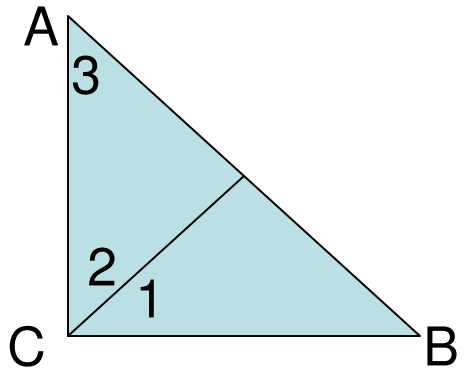




Given : $AC \perp CB$

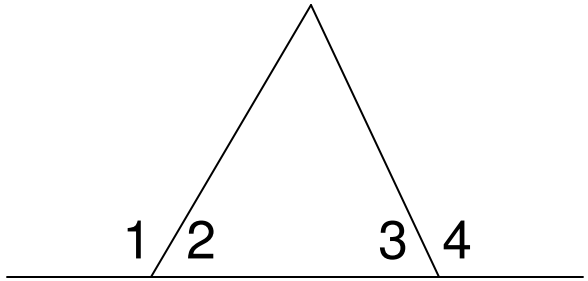
$\measuredangle 3$ is comp to $\measuredangle 1$

Prove : $\measuredangle 2 \cong \measuredangle 3$



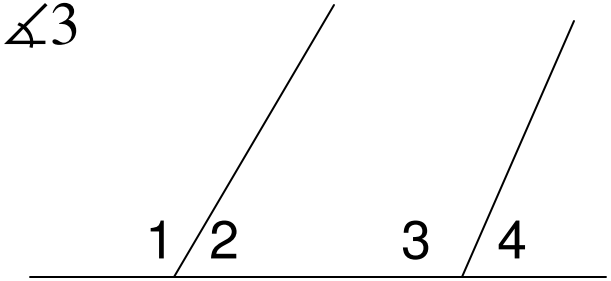
Given : $\measuredangle 2 \cong \measuredangle 3$

Prove : $\measuredangle 1 \cong \measuredangle 4$



Given : $\measuredangle 2$ is supp to $\measuredangle 3$

Prove : $\measuredangle 3 \cong \measuredangle 1$



Given : $\measuredangle 2 \cong \measuredangle 4$

Prove : $\measuredangle 2$ is supp to $\measuredangle 3$