

4-6L - Finding Pairs of Congruent Sides and Angles

Agenda

- Check & Review 4-5 Homework Proofs
- Guided Notes 4-6

Homework

- Finish Problem Set in Packet
- CR Due 11/17

Find each angle measure.

13. $m\angle E = 69^\circ$

14. $m\angle TRU = 33^\circ$

15. $m\angle F = 130^\circ$ or 172°

16. $m\angle A = 31^\circ$

20. $XZ = 20$

26. No; if a base \angle is obtuse, then the other base \angle would also have to be obtuse since they are \cong . The sum of the measures of the \angle of the \triangle cannot be greater than 180° .

26. **Critical Thinking** Can a base angle of an isosceles triangle be an obtuse angle? Why or why not?

Problem Set 4-4R/4-5L - Remember to also do the textbook problems

1. Given: $\overline{AB} \cong \overline{BC}, \overline{AD} \cong \overline{DC}$
 Prove: $\triangle BAD \cong \triangle BCD$

2. Given: $\triangle CAE$ is isosceles; $\overline{BF} \parallel \overline{CE}$
 Prove: $\triangle BAF$ is isosceles

Statements	Reasons
1. $\triangle CAE$ is isosceles	1. Given
2. _____	2. Isosceles Triangle Theorem
3. $\overline{BF} \parallel \overline{CE}$	3. Given
4. $\angle 1$ & $\angle C$ and $\angle 2$ & $\angle E$ are _____ angles	4. Defn of _____ angles
5. $\angle 1 \cong \angle C, \angle 2 \cong \angle E$	5. _____
6. $\angle 1 \cong \angle 2$	6. Substitution
7. $\triangle BAF$ is isosceles	7. _____

4-6 Notes ISOS Δ THM $\Delta \leftrightarrow \Delta$

Using the diagrams, determine the main concept behind the each piece of given information in terms of deducing that two question mark sides are congruent. Some would require more than one step; none is strictly "given".

- CONVERSE OF ISOS Δ THM
 \rightarrow DEFN OF ISOS Δ
- Given CAT is isosceles

DEFN OF ISOS Δ
 ISOSA \rightarrow 2 \cong SIDES
- DEFN OF SEGMENT BISECTOR
 OR
 SEG BIS \rightarrow 2 \cong SEGS
- \overline{KM} is a median of ΔJKL

MIDPOINT
 DEFN OF MEDIAN
 + DEFN OF MIDPOINT

- REFLEXIVE
- (2 possibilities)

OVERLAPPING SEGMENT THM
 SEGMENT ADD POST W/ ADD PROP OF EQ.
- M is the midpoint of \overline{GH}

DEFN OF MIDPOINT
 MIDPOINT \rightarrow 2 \cong SEGS
- D bisects \overline{AC} ;
 E bisects \overline{AB} ;
 $\overline{AC} \cong \overline{AB}$

DEFN OF SEGMENT BISECTOR
 HALVES OF \cong SEGS ARE \cong

Using the diagrams, determine the main concept behind the each piece of given information in terms of deducing that two question mark angles are congruent. Some would require more than one step; none is strictly "given".

- ISOS $\Delta \rightarrow$ \cong BASE \angle 'S
 ISOS Δ THM
- LINEAR PAIR DEFN

\rightarrow SUPP \angle 'S
 \rightarrow CONGRUENT SUPPLEMENTS THM
- $\parallel \rightarrow$ ALT INT \angle 'S \cong
- $\parallel \rightarrow$ CORRESP. \angle 'S \cong
- VERTICAL \angle 'S ARE CONGRUENT

- \perp LINES \rightarrow RT \angle 'S
 + RIGHT \angle 'S ARE \cong
- (2 possibilities)

\angle ADD POST W/ ADD PROP OF EQ
- \angle BISECTOR \rightarrow 2 \cong \angle 'S
- OVERLAPPING \angle THEOREM
- Halves of congruent angles are \cong
- Altitude of a triangle (\perp to base)
- REFLEXIVE

PRACTICE - You write the given (finish for homework if necessary)

Using the illustration at right, decide what information you would give in order for a classmate to be able to prove that $\triangle ABC \cong \triangle DEF$ using SAS \cong SAS differently for each example. Be more creative than all straightforward "givens" for each piece of information and decorate your drawing each time. Then write the proof.

1) Using $\angle A$ & $\angle D$ as included angles

Given:

$\overline{AB} \cong \overline{DE}$
 $\overline{AB} \parallel \overline{DE}$
 $\overline{AF} \cong \overline{DC}$

Actual Proof:

$\overline{AB} \cong \overline{DE}$ GIVEN
 $\overline{AB} \parallel \overline{DE}$ GIVEN
 $\angle A \cong \angle D$ REFLEX
 $\overline{AF} \cong \overline{DC}$ GIVEN
 $\overline{AC} \cong \overline{DF}$ REFLEX
 $\triangle ABC \cong \triangle DEF$ BY SAS \cong SAS OVERLAPPING SEG THM

Using the illustration at right, decide what information you would give in order for a classmate to be able to prove that $\triangle ABC \cong \triangle DEF$ using SAS \cong SAS differently for each example. Be more creative than all straightforward "givens" for each piece of information and decorate your drawing each time. Then write the proof.

2) Using $\angle B$ & $\angle E$ as included angles

Given:

$\overline{AB} \cong \overline{DE}$
 $\angle B \cong \angle E$
 $\overline{BC} \cong \overline{EF}$

Actual Proof:

$\overline{AB} \cong \overline{DE}$ GIVEN
 $\angle B \cong \angle E$ GIVEN
 $\overline{BC} \cong \overline{EF}$ GIVEN
 $\triangle ABC \cong \triangle DEF$ BY SAS \cong SAS
 $\angle B$ & $\angle E$ ARE RT \angle 'S

Using the illustration at right, decide what information you would give in order for a classmate to be able to prove that $\triangle ABC \cong \triangle DEF$ using SAS \cong SAS differently for each example. Be more creative than all straightforward "givens" for each piece of information and decorate your drawing each time. Then write the proof.

3) Using $\angle BCA$ & $\angle EFD$ as included angles

Given:

$\overline{BC} \cong \overline{EF}$
 $\overline{AC} \cong \overline{DF}$
 $\overline{BC} \parallel \overline{FE}$

Actual Proof:

$\overline{BC} \cong \overline{EF}$ GIVEN
 $\overline{AC} \cong \overline{DF}$ GIVEN
 $\overline{BC} \parallel \overline{FE}$ GIVEN
 $\angle BCA \cong \angle EFD$ REFLEX
 $\triangle ABC \cong \triangle DEF$ BY SAS \cong SAS

Problem Set 4-6L

1. Given the diagram, prove $\triangle MNK \cong \triangle KLM$ using

a) SAS \cong SAS with included $\angle N$ & $\angle L$

b) SAS \cong SAS with included $\angle NKM$ & $\angle LMK$