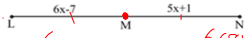
CODE RED – DO NOW

Complete Problems #1-3

1) What is the midpoint of $\overline{CD}$, given C (-4,2) and D (6,-2)?

$M=\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ (1, 0)

3) Point M is the midpoint of $\overline{LN}$. Find the length of $\overline{LM}$.



$6x-7=5x+1$

$x=8$

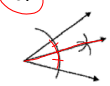
$6(8)-7$

41

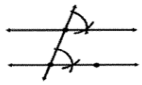
2) Which of these is an angle bisector?

a)

b)



c)



Proving Triangles Congruent

SOL G.6

Learning Target:

By the end of class today, I will be able to prove two triangles are congruent, using algebraic and coordinate methods as well as deductive proofs by completing a series of 20 problems as a class and completing an exit ticket with at least 75% accuracy.

Essential questions:

How can you prove figures to be congruent?

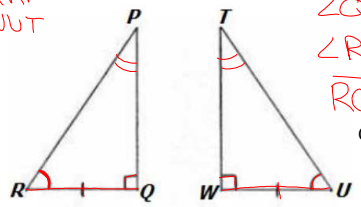
Today's Agenda

- ✓DO NOW
- ✓Labeling Congruent Parts
- ✓5 Ways to Prove Triangles Congruent
- ✓Partner Practice
- ✓Exit Ticket

CODE YELLOW

What do you know about these two triangles?

QRP
WUT



$\angle Q \cong \angle W$

$\angle R \cong \angle U$

$\overline{RQ} \cong \overline{WU}$

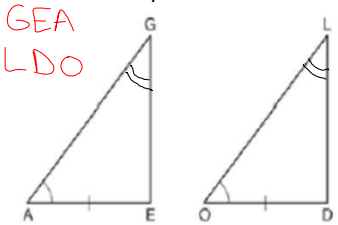
Congruence Statement:

$\Delta QRP \cong \Delta WUT$

CODE YELLOW

What do you know about these two triangles?

GEA
LDO



$\angle A \cong \angle O$

$\angle G \cong \angle L$

$\overline{AE} \cong \overline{OD}$

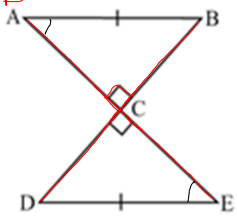
Congruence Statement:

$\Delta GEA \cong \Delta LDO$

CODE YELLOW

What do you know about these two triangles?

ECD
ACB



$\angle A \cong \angle E$

$\overline{AB} \cong \overline{ED}$

$\angle BCA \cong \angle DCE$

Congruence Statement:

$\Delta ECD \cong \Delta ACB$

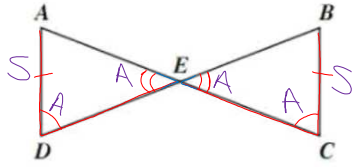
CODE YELLOW

$\angle ADE \cong \angle BCE$

$\overline{AD} \cong \overline{BC}$

$\angle AED \cong \angle BEC$

$\triangle ADE \cong \triangle BCE$

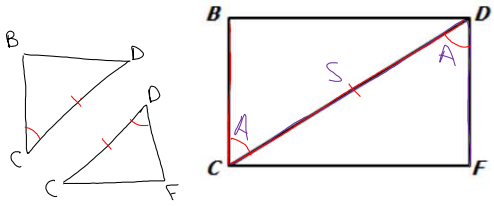


CODE YELLOW

$\angle CDF \cong \angle DCB$

$\overline{DC} \cong \overline{CD}$

$\triangle CBD \cong \triangle DFC$

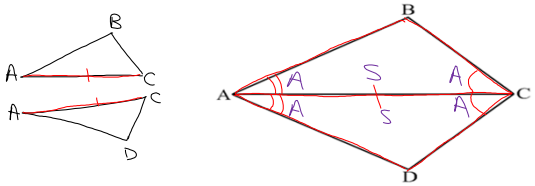


CODE YELLOW

$\overline{AC}$ bisects $\angle BCD$

$\overline{AC}$ bisects $\angle BAD$

$\triangle ABC \cong \triangle ADC$



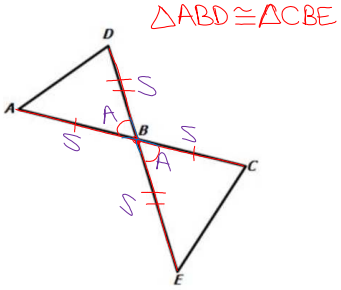
CODE YELLOW

B is the midpoint of $\overline{AC}$

B is the midpoint of $\overline{DE}$

$\angle ABD \cong \angle CBE$

$\triangle ABD \cong \triangle CBE$



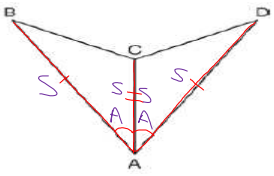
CODE GREEN

$\overline{AC}$ bisects $\angle BAD$

$\overline{DA} \cong \overline{BA}$

$\overline{AC} \cong \overline{CA}$

$\triangle BAC \cong \triangle DAC$



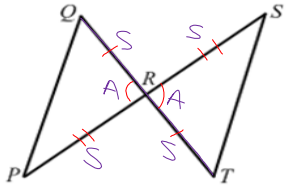
CODE GREEN

R is the midpoint of $\overline{QT}$

$\angle QRP \cong \angle TRS$

$\overline{PR} \cong \overline{SR}$

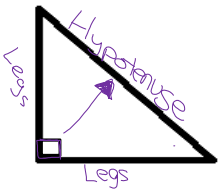
$\triangle RQP \cong \triangle RTS$



CODE YELLOW

Vocabulary

Right Triangle – A triangle with one right angle



Hypotenuse – the longest side of a right triangle

Legs – the other two sides of a right triangle

CODE YELLOW

There are 5 WAYS to PROVE TRIANGLES are CONGRUENT:

SSS : all sides are congruent

SAS : two sides and the angle between them are congruent

HL : the hypotenuse and one leg are congruent

ASA : two angles and the side between them are congruent

AAS : two angles and an attached side are congruent

CODE YELLOW

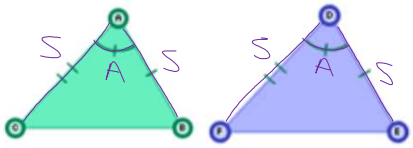
Side-Side-Side
Congruence Postulate

If three sides of one triangle are congruent to three sides of a second triangle, then the two triangles are congruent.

CODE YELLOW

Side-Angle-Side
Congruence Postulate

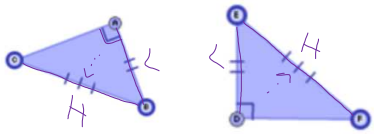
If two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle, then the two triangles are congruent.



CODE YELLOW

Hypotenuse-Leg
Congruence Theorem

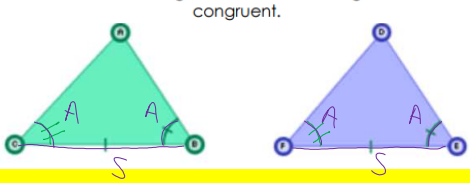
If the hypotenuse and a leg of a right triangle are congruent to the hypotenuse and a leg of a second right triangle, then the two triangles are congruent.



CODE YELLOW

Angle-Side-Angle
Congruence Postulate

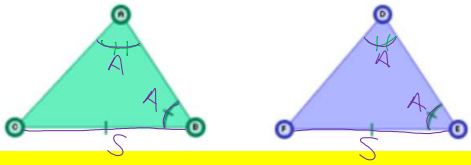
If two angles and the included side of one triangle are congruent to two angles and the included side of a second triangle, then the two triangles are congruent.



CODE YELLOW

ANGLE-ANGLE-SIDE
CONGRUENCE THEOREM

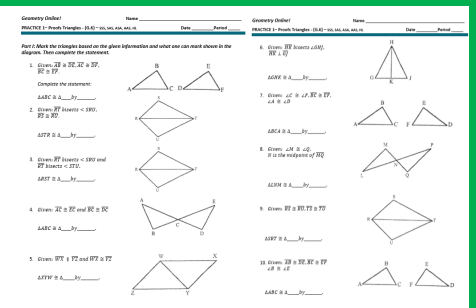
If two angles and a non-included side of one triangle are congruent to two angles and the corresponding non-included side of a second triangle, then the two triangles are congruent.



CODE GREEN

Complete #1-10 with your partner!

Raise your hand with questions.



CODE GREEN

Geometry Online! Name _____

PRACTICE 1– Proofs Triangles - (G.6) – SSS, SAS, ASA, AAS, HL Date _____Period ____

Part I: Mark the triangles based on the given information and what one can mark shown in the diagram. Then complete the statement.

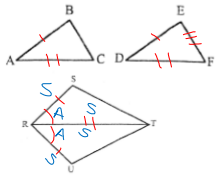
1. *Given:* $\overline{AB} \cong \overline{DE}, \overline{AC} \cong \overline{DF}, \overline{BC} \cong \overline{EF}$.

   Complete the statement:

   $\Delta ABC \cong \Delta$ DEF *by* SSS.

2. *Given:* $\overline{RT}$ *bisects* $\angle SRU$, $\overline{RS} \cong \overline{RU}$.

   $\Delta STR \cong \Delta$ UTR *by* SAS.



CODE GREEN

3. *Given:* $\overline{RT}$ *bisects* $\angle SRU$ *and* $\overline{RT}$ *bisects* $\angle STU$.

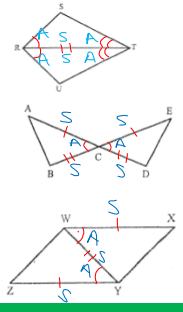
   $\Delta RST \cong \Delta$ RUT *by* ASA.

4. *Given:* $\overline{AC} \cong \overline{EC}$ *and* $\overline{BC} \cong \overline{DC}$

   $\Delta ABC \cong \Delta$ EDC *by* SAS.

5. *Given:* $\overline{WX} \parallel \overline{YZ}$ *and* $\overline{WX} \cong \overline{YZ}$

   $\Delta XYW \cong \Delta$ ZWY *by* SAS.



CODE GREEN

Geometry Online! Name _____

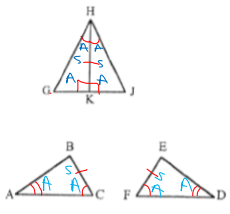
PRACTICE 1– Proofs Triangles - (G.6) – SSS, SAS, ASA, AAS, HL Date _____Period ____

6. *Given:* $\overline{HK}$ *bisects* $\angle GHJ$, $\overline{HK} \perp \overline{GJ}$

   $\Delta GHK \cong \Delta$ JHK *by* ASA.

7. *Given:* $\angle C \cong \angle F, \overline{BC} \cong \overline{EF}$, $\angle A \cong \angle D$

   $\Delta BCA \cong \Delta$ EFD *by* AAS.



CODE GREEN

8. *Given:* $\angle M \cong \angle Q$, *N is the midpoint of* $\overline{MQ}$

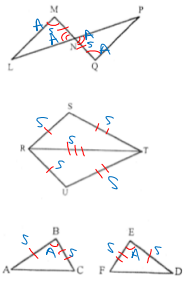
   $\Delta LNM \cong \Delta$ PNQ *by* ASA.

9. *Given:* $\overline{RS} \cong \overline{RU}, \overline{TS} \cong \overline{TU}$

   $\Delta SRT \cong \Delta$ URT *by* SSS.

10. *Given:* $\overline{AB} \cong \overline{DE}, \overline{BC} \cong \overline{EF}$ $\angle B \cong \angle E$

    $\Delta ABC \cong \Delta$ DEF *by* SAS.



CODE YELLOW

2-Column Proofs

Statement	Reason
Write the given information	Given
Look for vertical angles, shared sides or angles, or parallel lines	Vertical $\angle$s, Reflexive Property $\overline{AB} \cong \overline{BA}$ Alt. Int. $\angle$s, Corresponding $\angle$s
Use a rule to prove the Δs $\cong$	SSS, SAS, HL, ASA, AAS
Any corresponding parts are $\cong$	CPCTC

CODE RED – EXIT TICKET

Write a paragraph (3-5 sentences) summarizing what you learned in this lesson.

Complete your EXIT TICKET silently and independently at your seat. Remember to do your best and TRY every problem.

When you are finished, raise your hand and Coach Riddick will come around to collect it.