


January 22, 2019 Tuesday

Write all the facts you know about triangles...

3 SIDES & 3 angle
 They all equal 180°
 Make up many different angles
 Some of them rotate 90° CCW
 90° CW
 180°
 270°

30 + 60 + 90 = 180
 31 + 61 + 88 = 180



Jan 15-2:24 PM

Unit 2 test review:

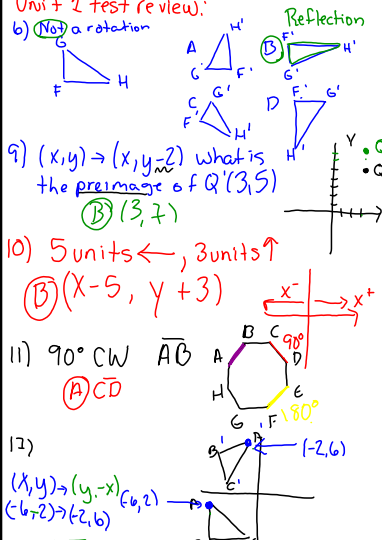
6) (No) a rotation
 Reflection

7) $(x, y) \rightarrow (x, y+2)$ what is the preimage of $Q'(3, 5)$
 (B) $(3, 7)$

10) 5 units ←, 3 units ↑
 (B) $(x-5, y+3)$

11) 90° CW \overline{AB}
 (A) \overline{CD}


12) $(x, y) \rightarrow (y-x, 2)$
 $(6, 2) \rightarrow (2, 6)$



Jan 22-12:02 PM

Triangle Congruence Theorems

hummm...what is congruence...



Let's figure out how to tell if two triangles are congruent...

Mashup Math, Triangle Congruence, video

Let's discover how to write triangle congruence statements...

TerryW, How to write triangle congruence statements ...write his example in your notebook!

Jan 18-2:15 PM

More from Terry V...

Congruence Statements

$\triangle GHI \cong \triangle JKL$

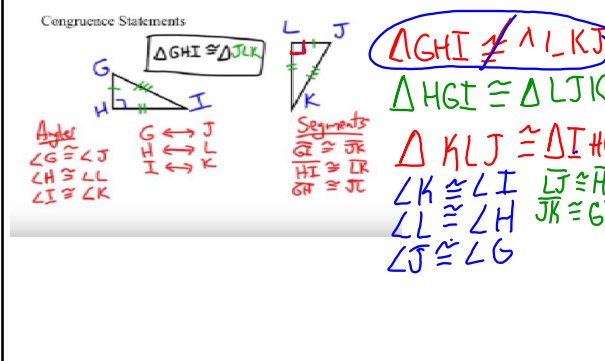
Angles: $\angle G \cong \angle J$, $\angle H \cong \angle K$, $\angle I \cong \angle L$

Segments: $\overline{GH} \cong \overline{JK}$, $\overline{HI} \cong \overline{KL}$, $\overline{GI} \cong \overline{JL}$

$\triangle KLI \cong \triangle IKG$

$\angle K \cong \angle I$, $\angle L \cong \angle H$, $\angle I \cong \angle G$

$\overline{KL} \cong \overline{LI}$, $\overline{LI} \cong \overline{IG}$, $\overline{KI} \cong \overline{GI}$



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Geometry Name _____ ID: 1

Triangle Congruence

State if the two triangles are congruent. If they are, state how you know.

1) $\triangle ABC \cong \triangle DEF$ SSS

2) $\triangle ABC \cong \triangle DEF$ SAS

3) $\triangle ABC \cong \triangle DEF$ ASA

4) $\triangle ABC \cong \triangle DEF$ AAS

5) $\triangle ABC \cong \triangle DEF$ HL

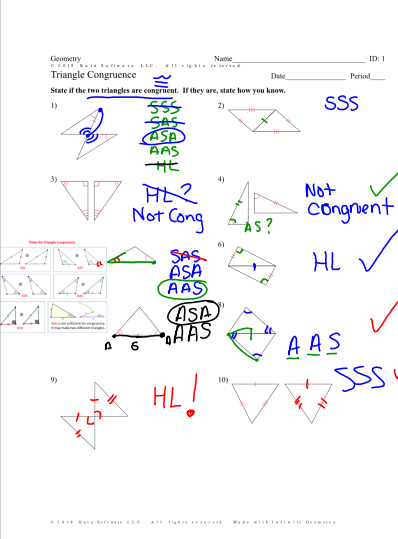
6) $\triangle ABC \cong \triangle DEF$ HL

7) $\triangle ABC \cong \triangle DEF$ HL

8) $\triangle ABC \cong \triangle DEF$ HL

9) $\triangle ABC \cong \triangle DEF$ HL

10) $\triangle ABC \cong \triangle DEF$ SSS



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Geometry Name _____ ID: 1

Unit 2 Quiz 2 Triangle Congruency - SG

Determine if the two triangles are congruent using SSS, SAS, ASA, AAS, or HL.

1) $\triangle ABC \cong \triangle DEF$ SAS

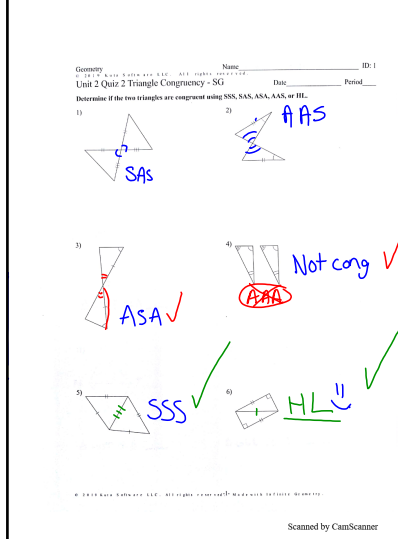
2) $\triangle ABC \cong \triangle DEF$ AAS

3) $\triangle ABC \cong \triangle DEF$ ASA

4) $\triangle ABC \cong \triangle DEF$ Not cong

5) $\triangle ABC \cong \triangle DEF$ SSS

6) $\triangle ABC \cong \triangle DEF$ HL



Jan 22-1:37 PM

Determine if the two triangles are congruent using SSS, SAS, ASA, AAS, or HL. Write the congruency statement if possible.

SAS ✓ **ASA** ✓
 $\triangle ABC \cong \triangle DCB$ $\triangle IDO \cong \triangle OIK$

PM **Vertical Angles** **AAS** ✓ **SSS** ✓
 $\triangle LME \cong \triangle YW$ $\triangle MLC \cong \triangle CEP$

BK **NOT congruent** **HL** ✓ **KB** **HL** ✓
 $\triangle NOT \cong \triangle$ $\triangle GLD \cong \triangle KMW$ ✓

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January 23, 2019, Wednesday

Give an example of congruent triangles using AAS and another set of triangles using HL.

...quiz after review

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https://www.softschools.com/math/geometry/triangles/congruent_triangles/

Topics: Pre-K Kindergarten 1st Grade 2nd Grade 3rd Grade 4th Grade 5th Grade

Math: Math Games Math Worksheets Algebra Language Arts Science Social Studies Literature

home > Math > Geometry > Triangles > Congruent Triangles

Congruent Triangles

There are five different ways to find triangles are congruent: SSS, SAS, ASA, AAS and HL. For each pair of triangles, select the correct rule.

start

Jan 18-2:23 PM

scratchpad, writing congruency statements, practice

Example... $\triangle XYZ \cong \triangle TRS$

Non-example $\triangle QPR \not\cong \triangle ZXY$

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Rules for Triangle Congruency

SSS SAS ASA AAS HL

SSA is not sufficient for congruency. It may make two different triangles.

Example 2
Congruent Triangles
 Write the Congruence Statement
 $\triangle ABC \cong \triangle ZXY$

Example 3
 $\triangle JKL \cong \triangle RST$
 $\angle J \cong \angle R$
 $\angle S \cong \angle K$
 $\overline{KL} \cong \overline{ST}$

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January 24, 2019, Thursday

Using the congruence statement
 Triangle ABC = Triangle ZYX list 3 congruent set of legs and 3 sets of congruent vertices.

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Congruent Triangles Guided Notes

Congruent Triangles have:

- _____
- _____

Corresponding parts: _____

Congruence Statement: _____

CPCTC: _____


Example: Complete each congruence statement.


1) If $\triangle ABC \cong \triangle DEF$, then $BC \cong$ _____


2) If $\triangle ABC \cong \triangle DEF$, then $\angle A \cong$ _____

3) $\triangle CAT \cong \triangle DOG$, then $AC \cong$ _____

4) $\triangle BAT \cong \triangle MON$, _____ $\cong \angle ONM$, _____ $\cong MO$, $NM \cong$ _____

5) $\triangle BCA \cong$ _____

 $\cong \triangle GFE$

6) _____ $\cong \triangle JKN$


7) _____ $\cong \triangle CBD$


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Congruent Triangles Practice

To add congruence markings or geometric properties, the information either has to be given, or you have to know what geometry property exists that would allow you to do so. **YOU CANNOT ASSUME ANYTHING!!!**

There are _____ ways to prove non-right triangles congruent.


(SSS) Congruence Postulate

Three sides of one triangle are congruent to three sides of a second triangle.




(SAS) Congruence Postulate

Two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle.




(ASA) Congruence Postulate

Two angles and the included side of one triangle are congruent to two angles and the included side of a second triangle.



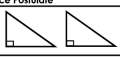
(AAS) Congruence Postulate

Two angles and a non-included side of one triangle are congruent to two angles and a non-included side of a second triangle.




(HL) Congruence Postulate


In a right triangle, the hypotenuse and one leg is congruent to the hypotenuse and leg of another right triangle.





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
Determine if each pair of triangles is congruent by SSS, SAS, ASA, AAS, or HL. If none of these methods work, write "none" and leave the congruence statement blank.


1. _____

 $\triangle OPN \cong$ _____

2. _____

 $\triangle SME \cong$ _____


3. _____

 $\triangle POT \cong$ _____


4. _____

 $\triangle HBP \cong$ _____


5. _____

 $\triangle PAT \cong$ _____


6. _____

 $\triangle TLP \cong$ _____


Tell whether each pair of triangles is congruent by SSS, SAS, ASA, AAS, or HL. If none of these methods work, circle No Congruency.


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2. 

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4. 


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
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
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Triangle Congruence Worksheet


Is it possible to prove that the triangles are congruent? If so, state the postulate or theorem you would use.


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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
23. 


24. 


25. 

26. 

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28. 

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30. 

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PROOF! you can't handle the PROOF

Given: $\overline{SA} = \overline{FA}$
 $\overline{AD} = \overline{AX}$
 Prove: $\triangle SAD \cong \triangle FAX$
 $\angle D = \angle X$
 $\overline{SD} = \overline{FX}$

Given: $\angle LOW \cong \angle MOW$
 $\angle WLO = \angle WMO$
 Prove: $\triangle LOW \cong \triangle MOW$
 $\overline{LO} = \overline{MO}$

Statements:	Reasons:
1. $\overline{SA} = \overline{FA}$	1. Given
2. $\angle 1 = \angle 2$	2. Given
3. _____	3. Given
4. $\triangle SAD \cong \triangle FAX$	4. _____
5. $\angle D = \angle X$	5. Corr. parts of $\cong \triangle$ are \cong
6. $\overline{SD} = \overline{FX}$	6. _____

Statements:	Reasons:
1. $\angle LOW = \angle MOW$	1. _____
2. $\overline{OW} = \overline{OW}$	2. _____
3. _____	3. Given
4. $\triangle LOW \cong \triangle MOW$	4. _____
5. _____	5. Corr. parts of $\cong \triangle$ are \cong

Name: _____

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PROOF! you can't handle the PROOF

Given: $OM \perp EY$
 M is the midpoint of EY
 Prove: $\triangle EOM \cong \triangle YOM$
 $\angle EOM \cong \angle YOM$

Statements:	Reasons:
1.	1. Given
2. $m\angle EMO = 90, m\angle OMY = 90$	2.
3. $m\angle EMO = m\angle OMY$	3. Transitive Property
4. $\angle EMO \cong \angle OMY$	4.
5. M is the midpoint of EY	5.
6.	6. Def. of a Midpoint
7. $OM = OM$	7.
8. $\triangle EOM \cong \triangle YOM$	8.
9. $\angle EOM \cong \angle YOM$	9.

Given: $AM \parallel CD, AM = CD, \angle M = \angle D$
 Prove: $\triangle AMC \cong \triangle CDO$

Statements:	Reasons:
1. $\angle M \cong \angle D$	1.
2.	2. Given
3. $AM \parallel CD$	3. Given
4. $\angle MAC \cong \angle DCO$	4.
5. $\triangle AMC \cong \triangle CDO$	5.
6. $MC = DO$	6.

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Triangle Congruency Proof Rules

Angle / Segment Addition Substitution Reflexive sides or angles Vertical Angles Corresponding Angles Complementary Supplementary	$\triangle A$ (Alternate Exterior Angle) $\triangle A$ (Alternate Interior Angle) Definition of Right Angle Definition of Perpendicular Definition of Congruent	Angle Bisector Mid-segment Perpendicular Bisector All right angles are congruent Base angles of an isosceles triangle are congruent
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Proofs Using CPCTC

Fill in the missing information for each proof.

1. Given: $GH \cong KL, \angle G \cong \angle K$, and $GI \cong KI$

Prove: $HI \cong LI$

Statements	Reasons
1. $GH \cong KL$	1. Given
2.	2. Given
3. $GI \cong KI$	3.
4.	4. SAS
5. $HI \cong LI$	5.

2. Given: $\angle MNP \cong \angle OPN$, and $MP \cong NP$

Prove: $MP \cong NP$

Statements	Reasons
1.	1. Given
2. $MP \cong NP$	2.
3. $NP \cong NP$	3.
4. $\triangle MNP \cong \triangle OPN$	4. SAS
5.	5. CPCTC

3. Given: $AC \cong CE, DC \cong BC$

Prove: $\angle B \cong \angle D$

Statements	Reasons
1.	1.
2. $\angle ACB \cong \angle DCE$	2. Given
3. $\triangle ACB \cong \triangle DCE$	3.
4. $\angle B \cong \angle D$	4. CPCTC
5. $\angle B \cong \angle D$	5.

4. Given: $PM \parallel NO, MN \parallel PO$

Prove: $PA \cong OA$

Statements	Reasons
1. $PM \parallel NO$	1.
2.	2. Given
3. $\angle PMA \cong \angle ONA$	3.
4. $\angle MPA \cong \angle NOP$	4. Alternate Interior
5. $MA \cong NA$	5. ASA
6.	6. ASA
7.	7.

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Write a two-column proof for each.

5. Given: $\angle N \cong \angle P, \angle M \cong \angle Q$, and $NO \cong QR$

Prove: $MO \cong PR$

6. Given: $AC \cong EF$, and $AB \cong FD$

Prove: $BC \cong FE$

7. Given: $MN \parallel NO, NP \cong OP$

Prove: $\angle O \cong \angle M$

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Unit 2 Test Part 1 Study Guide

1. Which theorems or rule are used to prove that two triangles are congruent?

2. Consider the triangles shown. Which rule, if any, can be used to prove triangle congruency?

3. If $m\angle 1 = 45, m\angle 2 = 30$ in the diagram below, find $m\angle 3$ and $m\angle 4$.

4. In the diagram below $m\angle 1 = 65, m\angle 4 = 3x + 5$. Find x and the measure of angle $\angle 4$.

5. Find $m\angle 3$ and $m\angle 2$, if $m\angle 1 = 85$ degrees.

6. Find $m\angle 1$ if $m\angle 2 = 5x$ and $m\angle 3 = 6x - 7$.

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7. $\triangle PQR$ and $\triangle STU$ are congruent triangles. Using this information, list the corresponding sides and corresponding angles.

8. For $\triangle EFG$ and $\triangle MNP$, it is known that $EG \cong MP, \angle G \cong \angle P$, and $FG \cong NP$. Determine if the triangles are congruent, and if so, by which type of congruency.

a. SSS c. ASA
 b. SAS d. It cannot be determined if the triangles are congruent.

9. In this diagram, ED is the perpendicular bisector of AB . The two-column proof shows that $\triangle AED$ is congruent to $\triangle BED$. Fill in the missing pieces of the proof. Bank: $AD = BD$, Vertical Angles, Reflexive Property, SSS, SAS, HL.

Step	Statement	Reason
1	ED is the perpendicular bisector of AB	Given
2	$AD = BD$	Definition of bisector
3	$ED = ED$	
4		Definition of perpendicular lines
5	$\angle ADC \cong \angle BDC$	All right angles are congruent
6	$\triangle ADC \cong \triangle BDC$	
7	$AC \cong BC$	

10. Given: $NO \parallel MP$ and $MN \parallel OP$
 Prove: $MN \cong OP$


Steps	Statements	Reasons
1	$NO \parallel MP$ and $MN \parallel OP$	
2	$\angle MNP \cong \angle OPN$	Alt. Interior \angle s are \cong .
3	$\angle NPM \cong \angle ONP$	Alt. Interior \angle s are \cong .
4	$NP \cong NP$	
5	$\triangle MNP \cong \triangle OPN$	

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11. Given: E is the midpoint of AC and DB. Rank: $\triangle AEB \cong \triangle CED$, vertical angles, Defn of midpoint BE = ED. Prove: $\triangle ABE \cong \triangle CED$

Steps	Statements	Reasons
1	E is the midpoint of AC and DB	Given
2	$AE \cong EC$	
3		Definition of a midpoint
4	$\angle AEB \cong \angle CED$	
5		SAS

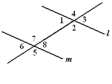


12. $\triangle DEF$ and $\triangle UVW$ are congruent triangles. Which statement is known to be true?
 a. $DE \cong UV$ c. $DF \cong UV$
 b. $DF \cong TU$ d. $DE \cong VW$

13. For $\triangle ABC$ and $\triangle DEF$, the following is given: $\angle C \cong \angle F$, $AB \cong DE$, and $BC \cong EF$. By which triangle congruence statement can it be concluded that the triangles are congruent?
 a. SSS c. ASA
 b. SAS d. It cannot be determined if the triangles are congruent.

14. $\triangle UVW$ and $\triangle XYZ$ are congruent triangles. Which statement is known to be true?
 a. $\angle U \cong \angle X$ c. $\angle V \cong \angle X$
 b. $\angle W \cong \angle X$ d. $\angle V \cong \angle Y$

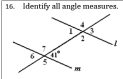
15. Name one set of each type of angles below.



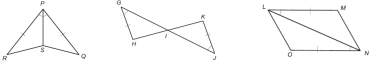
Corresponding: _____
 Alternate Interior: _____
 Alternate Exterior: _____
 Vertical: _____
 Same side interior: _____

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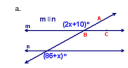
16. Identify all angle measures.




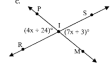
Congruent Triangles
 17. Determine whether each pair of triangles is congruent. If so, write a congruence statement, and explain why the triangles are congruent.




Theorems about Lines and Angles
 19. Name the relationship and then find the missing angle measures by solving for x.

a.  $(2x+10)^\circ$
 $(3x+4)^\circ$

b.  $(4x+6)^\circ$, $(11x-6)^\circ$

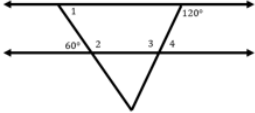
c.  $(4x+24)^\circ$, $(7x-3)^\circ$

d.  $(8x+7)^\circ$, $(3x+38)^\circ$

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Using the figure below, find each measure of each numbered angle.



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