

August 27, 2018

What does triangle congruency mean?

Find an explanation and a picture, using technology.

Aug 24-10:10 AM

Let's look at the triangle sum theorem...


Geogebra, interior triangle sum

Geogebra, triangle sum theorem

What is the triangle sum theorem?

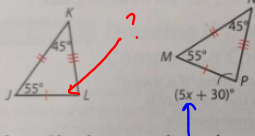
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Now the triangle sum theorem using paper.....



Aug 24-10:44 AM

Example 2 Find the value of the variable that results in congruent triangles.



Congruent
 $\angle K \cong \angle N \cong 45^\circ$
 $\angle J \cong \angle M = 55^\circ$
 $\angle L \cong \angle P$

Step 1 Identify corresponding angles.

$\angle M$ corresponds to $\angle J$, because they have the same measure and they are formed by congruent corresponding sides. Similarly, $\angle N$ corresponds to $\angle K$. So, $\angle P$ corresponds to $\angle L$.

$$55 + 45 + \angle L = 180$$

$$100 + \angle L = 180$$

$$-100 \quad -100$$

$$\angle L = 80^\circ$$

$$80 = 5x + 30$$

$$-30 \quad -30$$

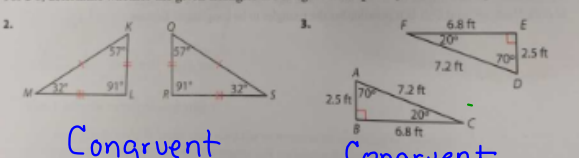
$$50 = 5x$$

$$\frac{50}{5} = \frac{5x}{5}$$

$$10 = x$$

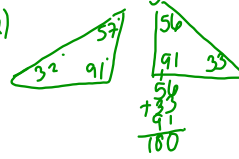
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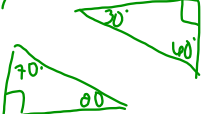
For 2-5, determine whether the given triangles are congruent. Explain your reasoning.



Congruent look @ sides → look @ angles →

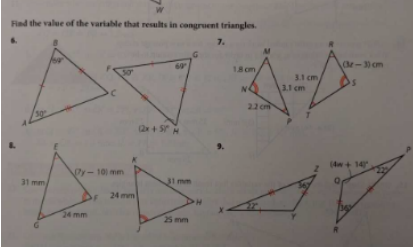
Not Congruent Not Congruent

2) 

3) 

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Find the value of the variable that results in congruent triangles.



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Triangle Sum Theorem
Practice Problems
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Find the measure of each angle indicated.

1) $? + 55 + 70 = 180$

2) $? + 35 + 85 = 180$

3) $? + 30 + 90 = 180$

4) $? + 45 + 35 = 180$

Solve for x.

5) $66 + x + 30 + 90 = 180$

6) $60 + 30x + 90 = 180$

7) $x + 44 + 55 = 180$

8) $18 + 2x + 40 = 180$

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Find the measure of angle C

9) $\angle C = 20(1) = 20$

11) $71x - 1 + 20x + 90 = 180$
 $91x + 89 = 180$
 $91x = 91$
 $x = 1$

12) $x + 52 + 67 + x + 75 = 180$
 $2x + 194 = 180$
 $-194 - 194$
 $2x = -14$
 $x = -7$

13) $A = -7 + 52$
 $A = 45$

14) $5x + 2 + 6x + 134 = 180$
 $11x + 136 = 180$
 $-136 - 136$
 $11x = 44$
 $x = 4$
 $A = 5(4) + 2$
 $A = 22$

15) $30x + 6x + 5 + 11 = 180$

16) $40 + 11x - 1 + 87 = 180$

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Choose 2 from #1-4
Choose 2 from #5-8
Choose 3 from #10-16

Circle these in red pen, please!

Aug 27-11:32 AM

August 28, 2018

What is the interior triangle sum theorem?
The 3 angle of any triangle = 180°

4) Solve for ?
7) Solve for x
14) Solve for A

4) $? + 85 + 35 = 180$
 $? + 120 = 180$
 $-120 - 120$
 $? = 60$

7) $x + 44 + 55 + 90 = 180$
 $x + 189 = 180$
 $-189 - 189$
 $x = -9$

14) $5x + 2 + 6x + 134 = 180$
 $11x + 136 = 180$
 $-136 - 136$
 $11x = 44$
 $x = 4$
 $A = 5(4) + 2$
 $A = 22$

Aug 28-7:51 AM

Quiz review

12) $m\angle 1 = 60$, $m\angle 2 = 2x$ Linear Pair

$\angle 1 + \angle 2 = 180$
 $x + 2x = 180$
 $3x = 180$
 $x = 60$

$2 \cdot x = 2 \cdot 60$
 $m\angle 1 = 60$, $m\angle 2 = 120$

Bonus Solve for all angles.

$80 + 2x = 180$
 $2x + 100 = 180$
 $-100 - 100$
 $2x = 80$
 $x = 40$

because vertical angle!

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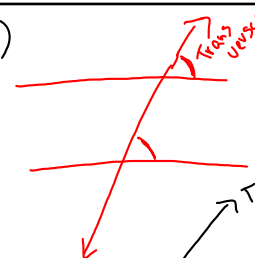

3) $2x = 80$
 $x = 40$

$4y = 60$
 $y = 15$

$4y + A = 180$
 $4(15) + A = 180$
 $-60 - 60$
 $A = 120$

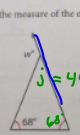
$x = 40$, $y = 15$, $A = 120$

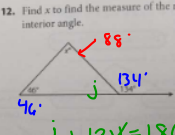
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2)  Corresponding \angle s.
 1)  alternate interior
 7 complementary $\angle = 90^\circ$
 8 supplementary or linear pair $\angle = 180^\circ$
 9 vertical angles

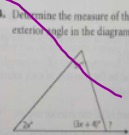
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p278-279 #11-15

11. Find w to find the measure of the exterior angle.
 $j = 44$
 $68 + 68 + j = 180$
 $136 + j = 180$
 $-136 \quad -136$
 $j = 44$
 j & w are a linear pair
 $44 + w = 180$
 $-44 \quad -44$
 $w = 136$

12. Find x to find the measure of the remote interior angle.
 88°
 $j + 134 = 180$
 $-134 \quad -134$
 $j = 46$
 $46 + 46 + x = 180$
 $92 + x = 180$
 $-92 \quad -92$
 $x = 88$

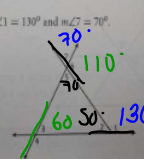
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14. Determine the measure of the indicated exterior angle in the diagram.
 $L = 56$

Find $m\angle H$.
 $6x - 1 + 5x + 17 + L = 180$
 $6x - 1 + 5x + 17 + 54 = 180$
 $11x + 70 = 180$
 $-70 \quad -70$
 $11x = 110$
 $\frac{11x}{11} = \frac{110}{11}$
 $x = 10$
 $\angle H = 6x - 1$
 $\angle H = 6(10) - 1$
 $\angle H = 59$

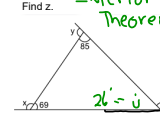
Match each angle with its corresponding measure, given $m\angle 1 = 130^\circ$ and $m\angle 7 = 70^\circ$.

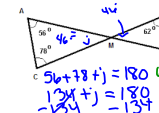
a. $\angle A$	50°
b. $m\angle 3$	60°
c. $m\angle 4$	70°
d. $m\angle 2$	110°
e. $m\angle 6$	120°

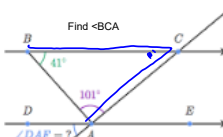
 60 70 130

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August 29, 2018

Find z . Interior Δ Sum Theorem
 $26 = j$
 $69 + 85 + j = 180$
 $154 + j = 180$
 $-154 \quad -154$
 $j = 26$


Find b .
 $108 + b = 180$
 $56 + 78 + j = 180$
 $134 + j = 180$
 $-134 \quad -134$
 $j = 46$
 $108 + b = 180$
 $-108 \quad -108$
 $b = 72$

Find $\angle BCA$.
 $41 + 101 + C = 180$
 $142 + C = 180$
 $-142 \quad -142$
 $C = 38$

Aug 28-11:39 AM

Unit 2 - Similarity Congruence & Proofs Name _____

Isosceles triangle - label all parts



Isosceles vocabulary, please define.

Isosceles triangle:

Leg -

Vertex angle -

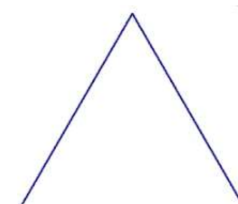
Base -

Base angle -

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Unit 2 - Similarity Congruence & Proofs Name _____

Equilateral Triangle



Find a minimum of three facts about equilateral triangles.

1)

2)

3)

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Triangle Congruency Manipulative

Are congruent if...	Side Side Side SSS	Angle Angle Side AAS	Side Angle Side SAS	Angle Side Angle ASA	Hypotenuse Leg HL
SSS SAS AAS ASA HL					

Aug 29-9:58 AM

Geometry _____ Name _____ ID: 1
 What congruency statement is used (if any)? Date _____ Period _____
 Determine if the two triangles are congruent. If they are, state how you know.

1) SAS

2) AAS

3) AAS

4) NOT congruent

5) SSS

6) NOT congruent

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7) SSS
 Reflexive Property

8) NOT congruent

9) NOT congruent

10) HL

11) SSS

12) HL

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13-18 then let me see!

13) SAS

14) AAS

15) SAS

16) ASA

17) NOT congruent

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18) ASA

State what additional information is required in order to know that the triangles are congruent for the reason given.

19) HL

20) SAS

21) HL

22) SSS

Aug 24-12:20 PM

August 30, 2018

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

1) SAS
 AAS

2) SAS

3) ASA
 $\overline{AD_1} = \overline{AD_2}$

4) SAS

5) SAS

6) NOT congruent

7) SAS

8) NOT congruent

Aug 30-7:57 AM

PROOFS SSS, ASA, AAS, SAS, HL

For these fill in any missing statements or reasons.

1. $\angle A \cong \angle D$, $\angle B \cong \angle E$, and $\angle C \cong \angle F$
 Given: $AB \cong DE$, $\angle B \cong \angle E$, and $\angle A \cong \angle D$

Prove: $\triangle ABC \cong \triangle DEF$

Statements	Reasons
1. $\angle A \cong \angle D$	1. Given
2. $\angle B \cong \angle E$	2. Given
3. $\angle C \cong \angle F$	3. Given
4. $\triangle ABC \cong \triangle DEF$	4. ASA

2. Given: $PO \cong RS$, and $\angle PQS \cong \angle RSQ$

Prove: $\triangle PQS \cong \triangle RSQ$

Statements	Reasons
1. $PO \cong RS$	1. Given
2. $\angle PQS \cong \angle RSQ$	2. Given
3. $QS \cong QS$	3. Reflexive Property
4. $\triangle PQS \cong \triangle RSQ$	4. SAS

3. Given: $AB \cong DE$, $AC \cong DF$, and $BC \cong EF$

Prove: $\triangle ABC \cong \triangle DEF$

Statements	Reasons
1. $AB \cong DE$	1. Given
2. $AC \cong DF$	2. Given
3. $BC \cong EF$	3. Given
4. $\triangle ABC \cong \triangle DEF$	4. SSS

4. Given: $\angle L \cong \angle N$, $\angle LOM \cong \angle NMO$

Prove: $\triangle LMO \cong \triangle NMO$

Statements	Reasons
1. $\angle L \cong \angle N$	1. Given
2. $\angle LOM \cong \angle NMO$	2. Given
3. $MO \cong MO$	3. Reflexive Property
4. $\triangle LMO \cong \triangle NMO$	4. AAS

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5. Given: \overline{AE} bisects \overline{BD} , $\angle A \cong \angle E$

Prove: $\triangle ABE \cong \triangle EAD$

Statements	Reasons
1. $\angle A \cong \angle E$	1. Given
2. \overline{AE} bisects \overline{BD}	2. Given
3. $\angle AEB \cong \angle EAD$	3. Definition of Bisect
4. $\overline{AE} \cong \overline{AE}$	4. Reflexive Property
5. $\triangle ABE \cong \triangle EAD$	5. ASA

6. Given: $PQ \parallel ST$, $PR \cong TR$

Prove: $\triangle PQR \cong \triangle TRS$

Statements	Reasons
1. $PQ \parallel ST$	1. Given
2. $\angle PQR \cong \angle TRS$	2. Alternate Interior Angles
3. $\angle QPR \cong \angle RTS$	3. Vertical Angles
4. $PR \cong TR$	4. Given
5. $\triangle PQR \cong \triangle TRS$	5. ASA

7. Given: $\overline{LM} \cong \overline{NO}$, and $\angle M \cong \angle O$

Prove: $\triangle LMO \cong \triangle NOP$

Statements	Reasons
1. $\overline{LM} \cong \overline{NO}$	1. Given
2. $\angle M \cong \angle O$	2. Given
3. $\angle LMO \cong \angle ONP$	3. Vertical Angles
4. $\triangle LMO \cong \triangle NOP$	4. AAS

8. Given: $\overline{AB} \parallel \overline{DC}$

Prove: $\triangle ABC \cong \triangle DCB$

Statements	Reasons
1. $\overline{AB} \parallel \overline{DC}$	1. Given
2. $\angle ABC \cong \angle DCB$	2. Alternate Interior Angles
3. $\overline{BC} \cong \overline{CB}$	3. Reflexive Property
4. $\triangle ABC \cong \triangle DCB$	4. ASA

Aug 30-8:04 AM

9. Given: $PQ \cong SU$, $QR \cong ST$, and $PR \cong TU$

Prove: $\triangle PQR \cong \triangle STU$

Statements	Reasons
1. $PQ \cong SU$	1. Given
2. $QR \cong ST$	2. Given
3. $PR \cong TU$	3. Given
4. $\triangle PQR \cong \triangle STU$	4. SSS

10. Given: N is the midpoint of \overline{MO} , $\overline{LN} \cong \overline{ON}$, and $\overline{LN} \cong \overline{PN}$

Prove: $\triangle LNO \cong \triangle PNO$

Statements	Reasons
1. $\overline{LN} \cong \overline{ON}$	1. Given
2. $\overline{LN} \cong \overline{PN}$	2. Given
3. N is the midpoint of \overline{MO}	3. Given
4. $\angle LNO \cong \angle PNO$	4. Vertical Angles
5. $\triangle LNO \cong \triangle PNO$	5. SAS

11. Given: C is the midpoint of \overline{BE} , $\angle B \cong \angle E$, and $\overline{AB} \cong \overline{DE}$

Prove: $\triangle ABC \cong \triangle DEC$

Statements	Reasons
1. $\angle B \cong \angle E$	1. Given
2. $\overline{AB} \cong \overline{DE}$	2. Given
3. $\overline{BC} \cong \overline{CE}$	3. Midpoint
4. $\triangle ABC \cong \triangle DEC$	4. SAS

12. Given: \overline{QT} bisects \overline{SP} , \overline{SP} bisects \overline{QT}

Prove: $\triangle QTP \cong \triangle STP$

Statements	Reasons
1. \overline{QT} bisects \overline{SP}	1. Given
2. \overline{SP} bisects \overline{QT}	2. Given
3. $\overline{QT} \cong \overline{ST}$	3. Definition of Bisector
4. $\overline{SP} \cong \overline{ST}$	4. Definition of Bisector
5. $\angle QTP \cong \angle STP$	5. Vertical Angles
6. $\triangle QTP \cong \triangle STP$	6. SAS

Aug 30-8:04 AM

STUDY GUIDE

Geometry Name: _____ Date: _____ Period: _____

Triangle Congruence

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

- ASA
- SSS
- NOT Congruent
- NOT Congruent
- AAS
- HL
- ASA
- AAS
- HL
- SSS

Aug 30-8:06 AM

9)

Write the congruence Statement

$\triangle DCB \cong \triangle ACB$

10)

Write the congruence Statement

$\triangle MCL \cong \triangle ECP$

ORDER!

Aug 30-8:06 AM

August 31, 2018

1. Given: $\overline{AE} \cong \overline{DC}$, $\overline{AC} \cong \overline{EC}$

Prove: $\triangle ABC \cong \triangle ADC$

Statements	Reasons
1. $\overline{BC} \cong \overline{DC}$, $\overline{AC} \cong \overline{AC}$	1. Given
2. $\angle BCA \cong \angle DCE$	2. Vertical \angle Theorem
3. $\triangle ABC \cong \triangle ADC$	3. SAS

Aug 30-8:09 AM

2. Given: $\overline{JK} = \overline{LK}$; $\overline{JM} = \overline{LM}$
 Prove: $\triangle KJM \cong \triangle KLM$

Statements	Reasons
1. $\overline{JK} = \overline{LK}$, $\overline{JM} = \overline{LM}$	1. GIVEN
2. $\overline{KM} = \overline{KM}$	2. Reflexive Property
3. $\triangle KJM \cong \triangle KLM$	3. SSS

3. Given: $\angle G = \angle I$; \overline{FH} bisects $\angle GFI$
 Prove: $\triangle GFH \cong \triangle IFH$

Statements	Reasons
1. $\angle G = \angle I$; \overline{FH} bisects $\angle GFI$	1. GIVEN
2. $\angle GFH = \angle IFH$	2. Def. of bisector
3. $\overline{FH} = \overline{FH}$	3. Reflexive Prop.
4. $\triangle GFH \cong \triangle IFH$	4. AAS

Aug 30-8:09 AM

Quiz

Choose 4 #1-7
 Choose 1 #8-9
 Choose 1 #10-11

Bonus: MODIFIED (do not answer the proof)
 How can these triangles be proved congruent?
 Write the congruency statement for the triangle.

Aug 31-10:09 AM

p 286

Copy Equilateral Triangle Theorem & Converse of the Equilateral Triangle Theorem.

Aug 24-10:57 AM

p289 #4-9

Find the measure of the indicated angle.

4. $m\angle A$ 5. $m\angle R$

6. $m\angle O$ 7. $m\angle E$

For 8-11, find the length of the indicated side.

8. \overline{DE} 9. \overline{KL}

Aug 24-10:58 AM

Geometry Name _____ ID: 1
 Finding side & angles of isosceles and equilateral triangles
 Find the value of x.

1) 2) 3) 4) 5) 6) 7) 8) 9) 10)

Aug 24-11:10 AM

11) 12) 13) 14) 15) 16) 17) 18) 19) 20)

Aug 24-11:10 AM

p203

copy ASA triangle congruence theorem

Aug 24-11:11 AM

p206 #3-6

Determine whether the triangles are congruent. Explain your reasoning.

Aug 24-11:40 AM

p213 copy the SAS triangle congruence theorem

Aug 24-12:26 PM

p216 #2-7

Determine whether the triangles are congruent. Explain your reasoning.

Aug 24-12:27 PM

p222

copy SSS triangle congruence

Aug 24-12:06 PM

p227 #4-11

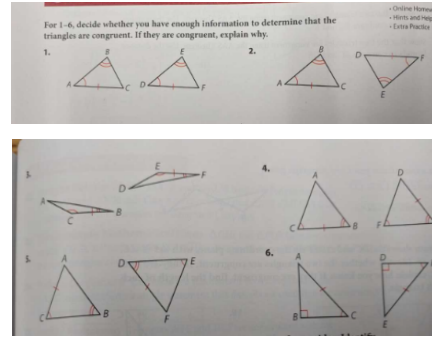
Identify a sequence of rigid motions that maps one side of $\triangle ABC$ onto one side of $\triangle DEF$.

Aug 24-12:07 PM

p246 copy the AAS congruence statement

Aug 24-12:10 PM

p 250 #1-6

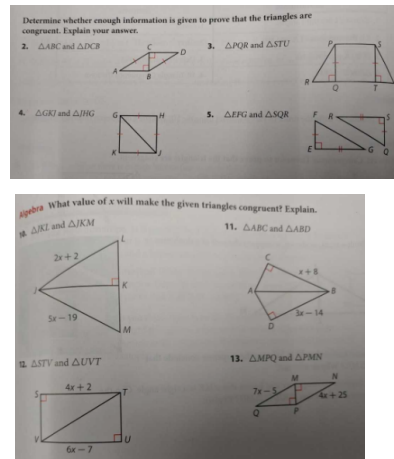


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p256 copy HL congruence theorem

Aug 24-12:14 PM

p258 2-5, 10-13



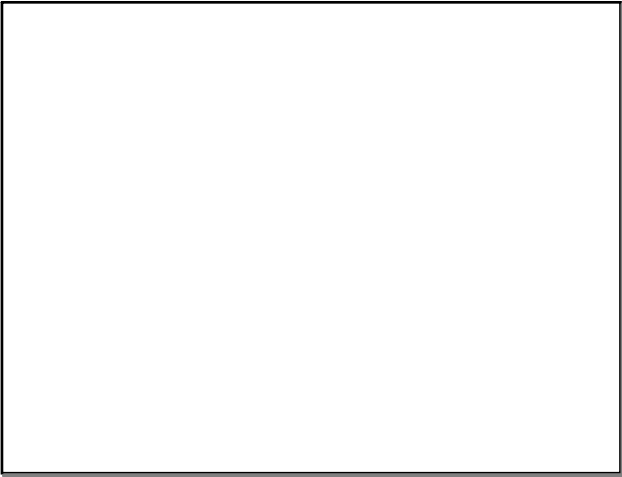
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Study Guide

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Test

Aug 24-12:20 PM



Aug 24-12:25 PM