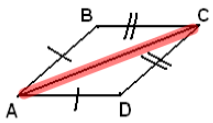
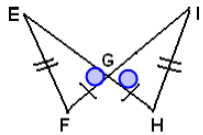
1 For each problem, name **ALL** of the pairs of congruent triangles you see in each figure by naming an appropriate correspondence. Also, provide a reason for each pair of congruent triangles you find. If none of the triangles are congruent, simply respond with "No." **PLEASE DRAW IN ANY ADDITIONAL ITEMS YOU FIND CONGRUENT IN THE FIGURE.**



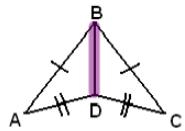
Yes

△ABC ≅△ADC
SSS



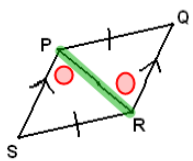
No

[SSA is bad]



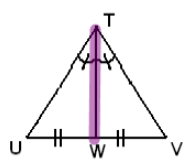
Yes

△ABD ≅△CBD
SSS



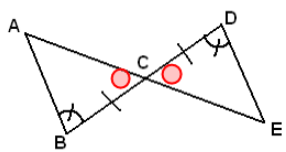
No!

$\overline{PS}$ and $\overline{QR}$ are parallel, not congruent.



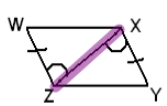
No!

(You don't know it is isosceles ... SSA is bad)



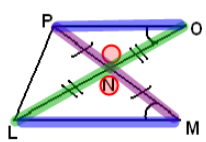
Yes

△ABC ≅△EDC
ASA



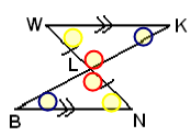
Yes

△WZX ≅△YXZ
SAS



Yes

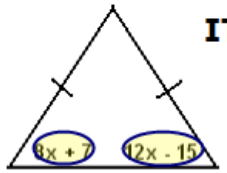
△MNL ≅△PNO
SAS



Yes

△WLK ≅△NLB

2 Solve for x.



8x + 7 = 12x - 15
22 = 4x
x = 5.5

3 Two side lengths of a triangle are **314 and 196.** Find *all possible values* for the third side's length.
(Briefly explain how you got your answer.)

314 + 196 = 510

314 - 196 = 118

118 < x < 510

The sum of the lengths of any two sides in a triangle must be greater than the third. (Triangle Inequality Theorem)

4

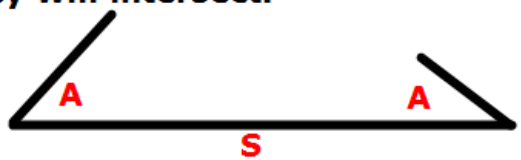
Does ASA work to show that two triangles are congruent?

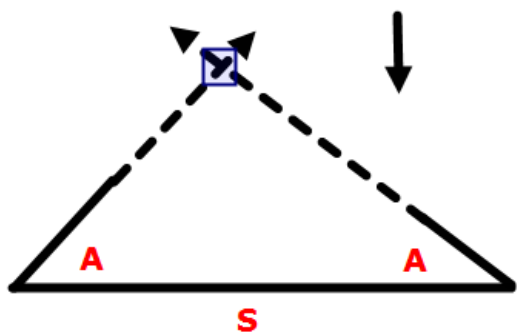
Explain your answer convincingly below.

(You can write an explanation, but *you need a picture for full credit*).

Yes - it works!

If given angle-side-angle, you would draw the initial figure as pictured below. Then, when extending the two sides highlighted, there is only one spot where they will intersect.





Therefore, given an ASA setup, there is only one triangle that can be formed fitting the particular description, so if you have two, they must be congruent!

5

Does SSS work to show that two triangles are congruent?
(That is, does it produce at most one triangle for a given set of conditions.)

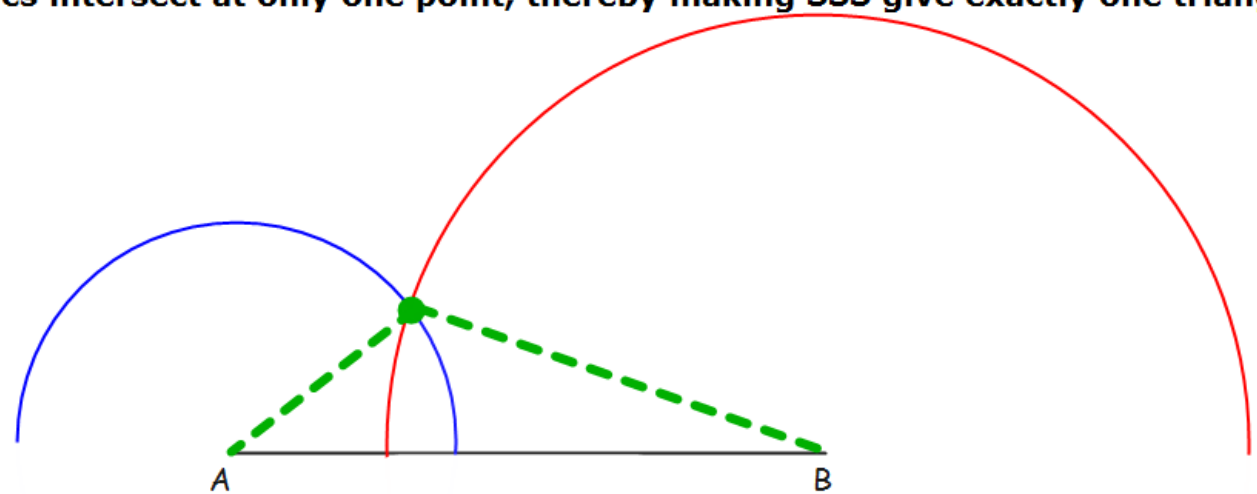
Explain your answer *convincingly* below.

(You can write an explanation, but *you need a picture for full credit*).

Yes - it works!

If given side-side-side, you would draw the initial figure as pictured below (one side).

Then, you know how far the third point must be from both A and B. Using your compass, draw the corresponding arc for each. These arcs intersect at only one point, thereby making SSS give exactly one triangle.



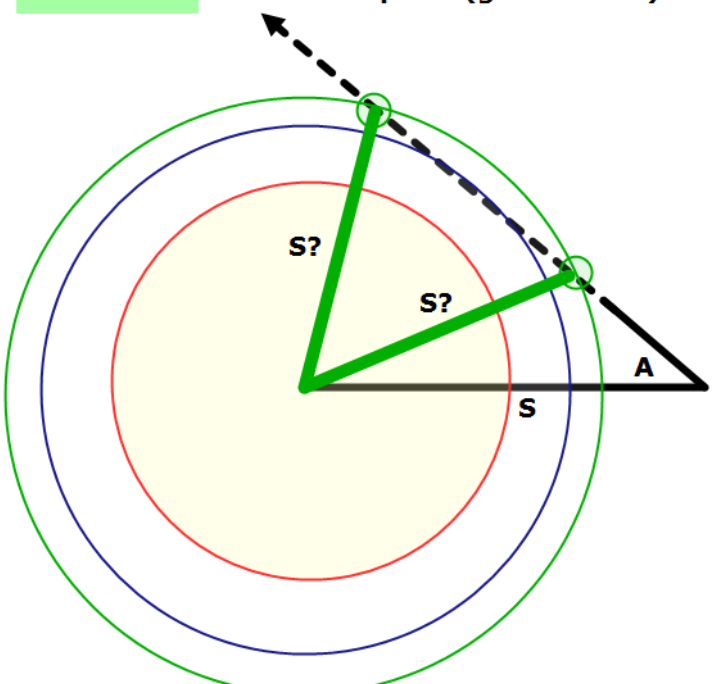
6 **Does SSA work to show that two triangles are congruent? Why or Why not?**

Explain your answer convincingly below.

(You can write an explanation, but *you need a picture for full credit*).

No, it does NOT work.

You could have no triangles fit the description (red circle), one triangle fit the description (blue circle), or TWO DIFFERENT TRIANGLES fit the description (green circle).



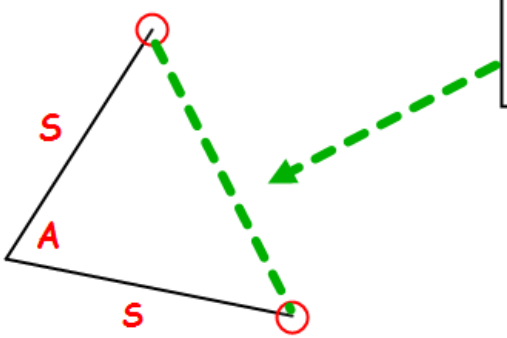
7

Does SAS work to show that two triangles are congruent?
(That is, does it produce at most one triangle for a given set of conditions.)

Explain your answer *convincingly* below.

Yes - it works!

If given side-angle-side, you would draw the initial figure as pictured below (one side and the angle).



There is only one way to connect the sides to form a triangle.

Since only one triangle can be formed given SAS, it is a valid triangle shortcut

8

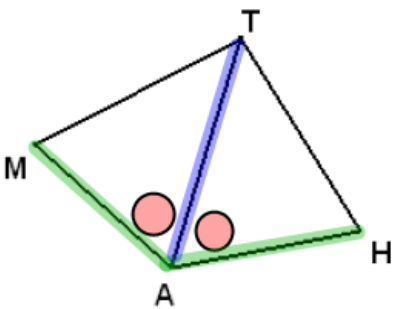
Given:

$\overline{MA} \cong \overline{AH}$

$\overline{AT}$ bisects $\angle MAH$

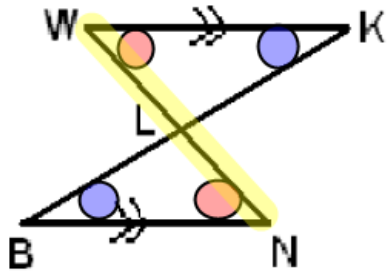
Prove:

$\overline{MT} \cong \overline{TH}$



S	R
1.) $\overline{MA} \cong \overline{AH}$, $\overline{AT}$ bisects $\angle MAH$	1.) Given
2.) $\angle MAT \cong \angle HAT$	2.) Def. of Bisector
3.) $\overline{AT} \cong \overline{AT}$	3.) Reflexive
4.) $\triangle MAT \cong \triangle HAT$	4.) SAS (1,2,3)
5.) $\overline{MT} \cong \overline{TH}$	5.) PCP

9



Given:

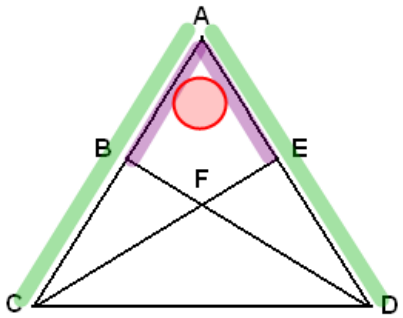
$\overline{WK} \parallel \overline{BN}$
L is the midpoint of $\overline{WN}$

Prove:

$\overline{KL} \cong \overline{BL}$

S	R
1.) $\overline{WK} \parallel \overline{BN}$ L is the midpt of $\overline{WN}$	1.) Given
2.) $\overline{WL} \cong \overline{LN}$	2.) Definition of a midpoint
3.) $\angle K \cong \angle B$ $\angle W \cong \angle N$	3.) Alternate Interior Angles
4.) $\triangle WKL \cong \triangle NBL$	4.) AAS(2,3,3)
5.) $\overline{KL} \cong \overline{BL}$	5.) PCP

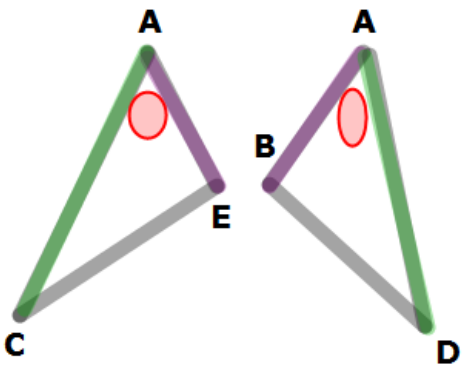
10 Provide a proof of the following:



Given: $\overline{AC} \cong \overline{AD}$, $\overline{AB} \cong \overline{AE}$

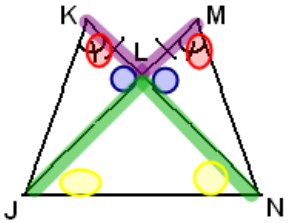
Prove: $\angle ACE \cong \angle ADB$

S	R
1.) $\overline{AC} \cong \overline{AD}$, $\overline{AB} \cong \overline{AE}$	1.) Given
2.) $\angle A \cong \angle A$	2.) Reflexive
3.) $\triangle ACE \cong \triangle ADB$	3.) SAS (1,1,2)
4.) $\angle ACD \cong \angle ADB$	4.) PCP



BON

Provide a proof of the following:



Given:	Prove:
$\overline{KL} \cong \overline{LM}$	$\overline{LJ} \cong \overline{LN}$
$\angle K \cong \angle M$	AND
	$\angle LJN \cong \angle LNJ$

S	R
1.) $\overline{KL} \cong \overline{LM}$, $\angle K \cong \angle M$	1.) Given
2.) $\angle KLJ \cong \angle MLN$	2.) VAT
3.) $\triangle KLJ \cong \triangle MLN$	3.) ASA (1,1,2)
4.) $\overline{LJ} \cong \overline{LN}$	4.) PCP
5.) $\angle LJN \cong \angle LNJ$	5.) ITT