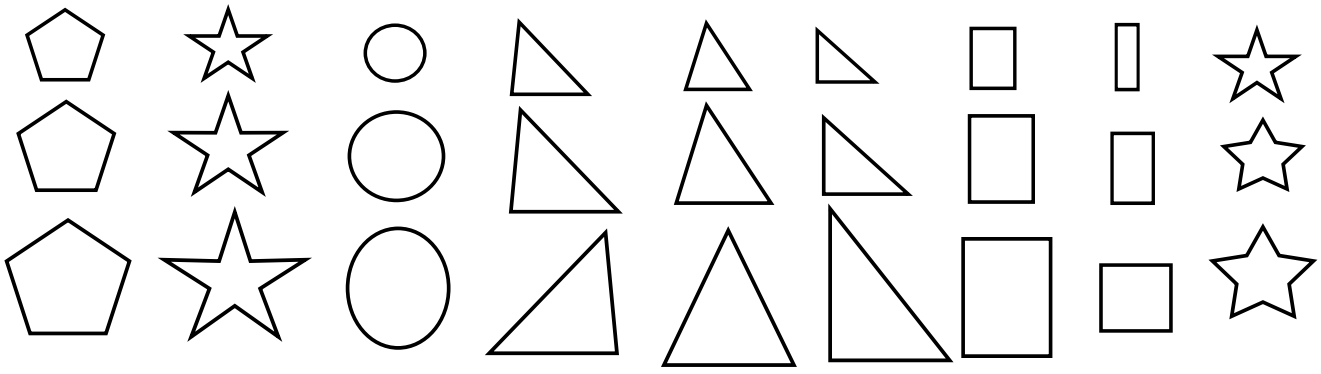
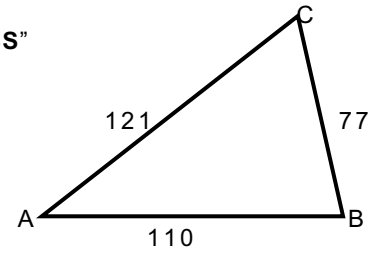
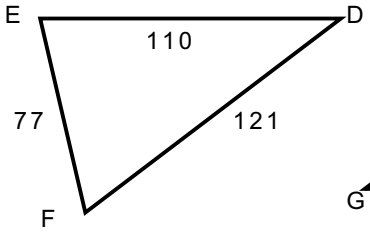
123 123 12 123 12 12 123 23

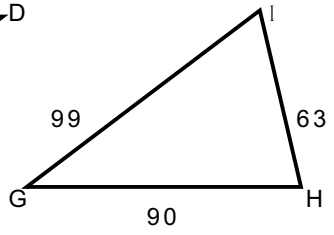
1. 

Similar figures have the same shape but not necessarily the same size. Which of the above are similar?

2. "**SSS**"







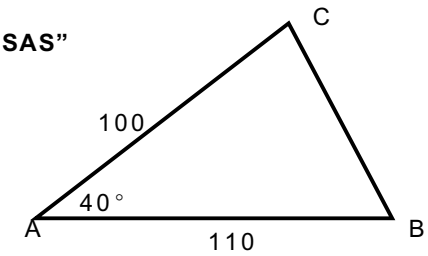
Which of these triangles are congruent?

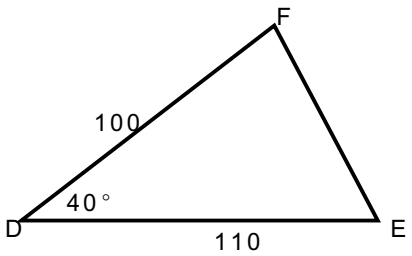
Which are similar?

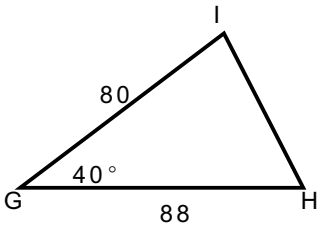
IF the three sides of △ABC are **congruent** to the *respective* sides of △DEF then △ABC ≅ △DEF .

IF the lengths of the three sides of △ABC and the *corresponding* sides of △GHI all form the **same RATIO**, then the triangles are **similar**. We write: △ABC **~** △GHI

3. **"SAS"**



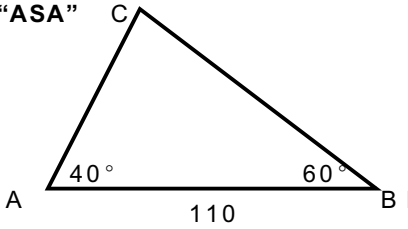


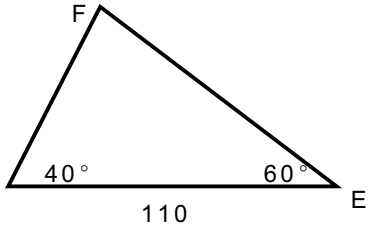


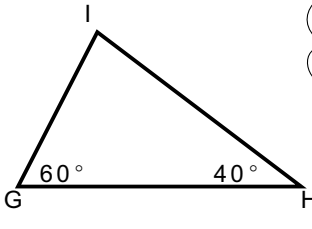
If two sides and the included angle of △ABC are congruent to the corresponding sides and included angle of △DEF then they are congruent— △ABC ≅ △GHI

If two sides of △ABC and the corresponding sides of △GHI form the same ratio, and the included angles are congruent, then the two triangles are similar: △ABC ~ △GHI

4. **"ASA"**





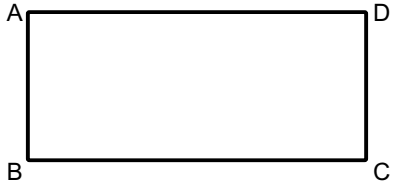


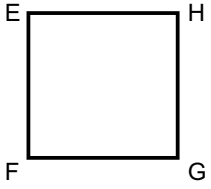
Since no "side information" is needed, it is not "ASA" theorem, it is "AA"

~~ASA~~ **"AA"**

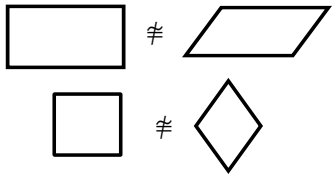
Warning: What works for Triangles does not necessarily work for Quadrilaterals, or other figures.

5. AAA → similar triangles
AAAA ↛ similar quadrilaterals

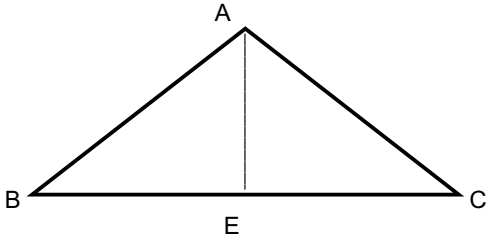




Recall: SSS → congruent triangles *but* SSSS ↛ congruent quadrilaterals.



6. Triangle ABC has **congruent sides AB & AC.** The midpoint of BC is "E". Is AE an altitude of △ABC?

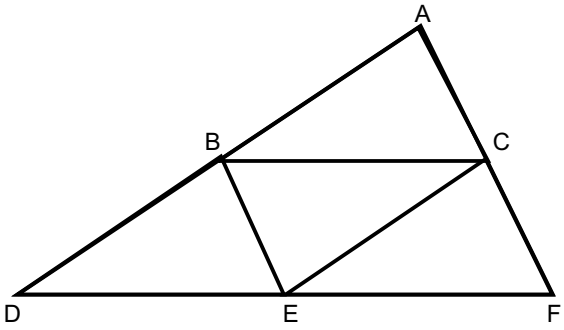


What triangles are congruent, and how do we know?

What do we know about ∠ABE and ∠ACE?

What do we know about ∠AEB and ∠AEC?

7.



Given that:

B is the **midpoint** of segment $\overline{AD}$. C is the **midpoint** of $\overline{AF}$.

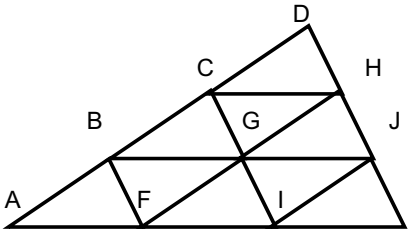
E is the **midpoint** of segment $\overline{DF}$.

What segments are parallel?

What triangles are congruent, and why?

What triangles are similar, but not congruent?

8.



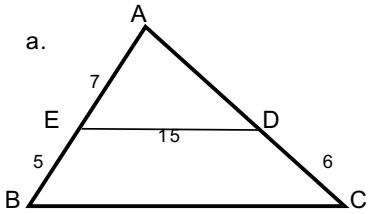
Points B & C "cut" segment $\overline{AD}$ into thirds.
Similarly F& I and H&J cut segments $\overline{AK}$ and $\overline{DK}$ into thirds.

What can be said about segments $\overline{BJ}$ and $\overline{AK}$?

What can be said about triangles BJD and AKD?

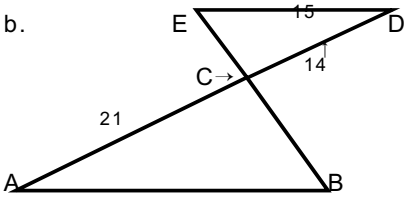
If AB is $5u$, then, since B & C cut $\overline{AD}$ in thirds, BD must be $2{\cdot}5u$, i.e. $10u$, and AD must be $15u$.
If BJ is $12\ u$, then AK must be _____ .

9. a.



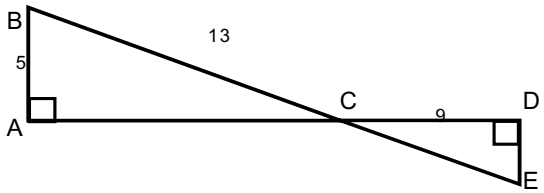
given: $\overline{BC} \parallel \overline{ED}$

b.



$\overline{AB} \parallel \overline{DE}$

c.*



∠A and ∠D are both right angles.

All segments that appear straight are straight (including ACD and BCE in 2nd and 3rd sketches).
What triangles are similar and why? Can you find the missing segment lengths?

a. AD =

BC =

b. AB =

How would length BC compare to length EC ?
But do we KNOW what EC is? BC?
The SCALING factor from △DEC to △ABC is ...

c. DE =

Hint: How can we find length AC?

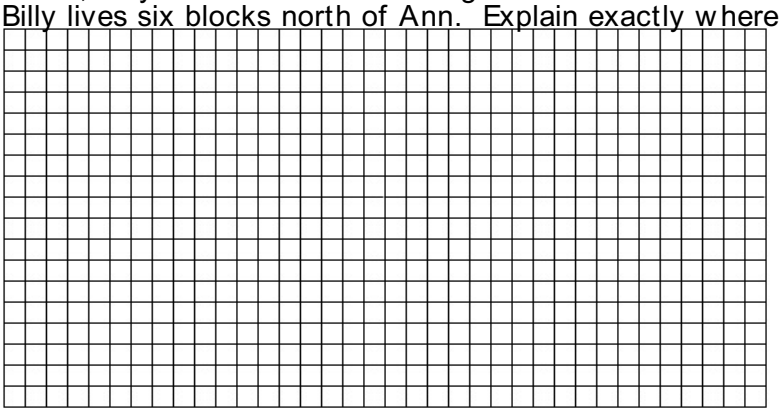
10. The sun is up in the sky, and casts a four-foot shadow for a five-foot tall person. At the same time, the shadow of the redwood tree is 70 feet long. What is the height of the redwood tree?

Math 310 ♥ SIMILARITY some challenging problems ♥

1. If held 10" from the wall, a spray gun paints a disc 3" in diameter.
How far from the wall should the gun be held to spray a toy that is 6" wide?
Additional, TOUGH QUESTION: * If at 10" we spray for 1 second, at the new distance, how long should we spray to get the same thickness of paint?

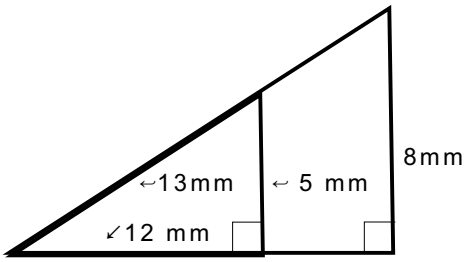
110'

12. * Tom, Billy and Ann live in a straight line. Tom lives four blocks north and twelve blocks west of Billy. Billy lives six blocks north of Ann. Explain exactly where Ann lives relative to Billy. (Hint: draw a map!)



13. * A 6' tall man standing 3' from a lamppost casts a shadow 4.5' long.
How long would his shadow be if he stood 6' away from the lamp?

14. Find the dimensions of the outer triangle:



20.8,19.2,8

15. See Practice Final, Section *I*