Lesson 12 Summary

How do we know if two figures are congruent?

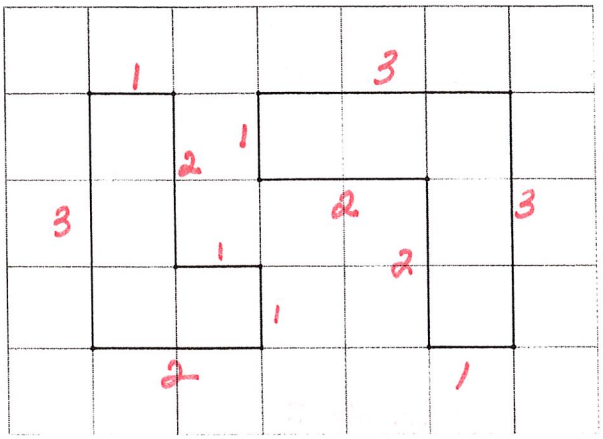
- If we copy one figure on tracing paper and move the paper so the copy covers the other figure exactly, then that suggests they are congruent.

- We can prove that two figures are congruent by describing a sequence of translations, rotations, and reflections that move one figure onto the other so they match up exactly.

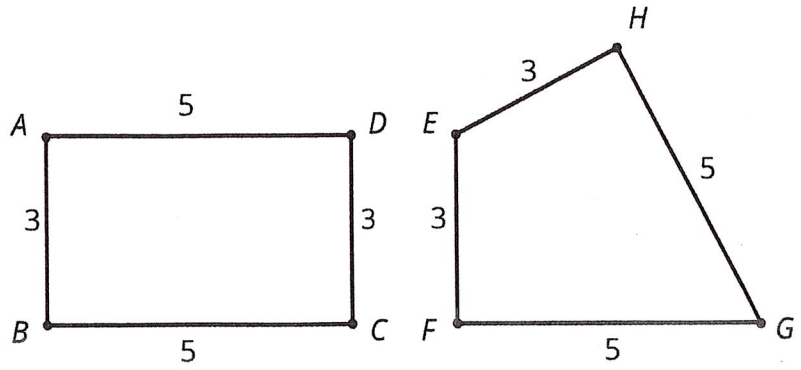
How do we know that two figures are *not* congruent?

- If there is no correspondence between the figures where the parts have equal measure, that proves that the two figures are *not* congruent. In particular,

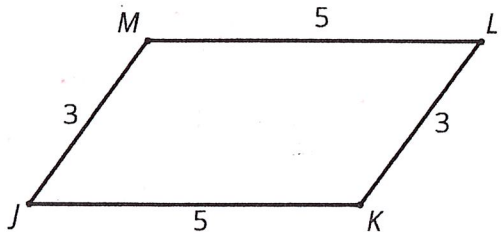
  - If two polygons have different sets of side lengths, they can't be congruent.For example, the figure on the left has side lengths 3, 2, 1, 1, 2, 1. The figure on the right has side lengths 3, 3, 1, 2, 2, 1. There is no way to make a correspondence between them where all corresponding sides have the same length.



- If two polygons have the same side lengths, but their orders can't be matched as you go around each polygon, the polygons can't be congruent. For example, rectangle $ABCD$ can't be congruent to quadrilateral $EFGH$. Even though they both have two sides of length 3 and two sides of length 5, they don't correspond in the same order. In $ABCD$, the order is 3,5,3,5 or 5,3,5,3; in $EFGH$, the order is 3,3,5,5 or 3,5,5,3 or 5,5,3,3.



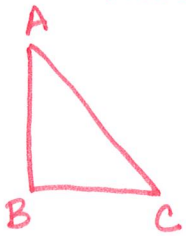
- If two polygons have the same side lengths, in the same order, but different corresponding angles, the polygons can't be congruent. For example, parallelogram $JKLM$ can't be congruent to rectangle $ABCD$. Even though they have the same side lengths in the same order, the angles are different. All angles in $ABCD$ are right angles. In $JKLM$, angles J and L are less than 90 degrees and angles K and M are more than 90 degrees.

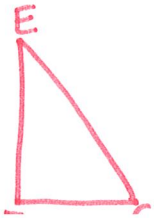


* Angles are different
* Areas are different
* The 2 shapes cannot lie perfectly on top of one another.

* Corresponding letters need to match when naming shapes.

Ex. Translate $\triangle ABC$ down. Name the triangles in the same order to be correct.





$\triangle ABC$ is congruent to $\triangle EFG$ (not $\triangle FEG$ or $\triangle GFE$)

A corresponds with E
B " " F
C " " G