

Congruence and Symmetry

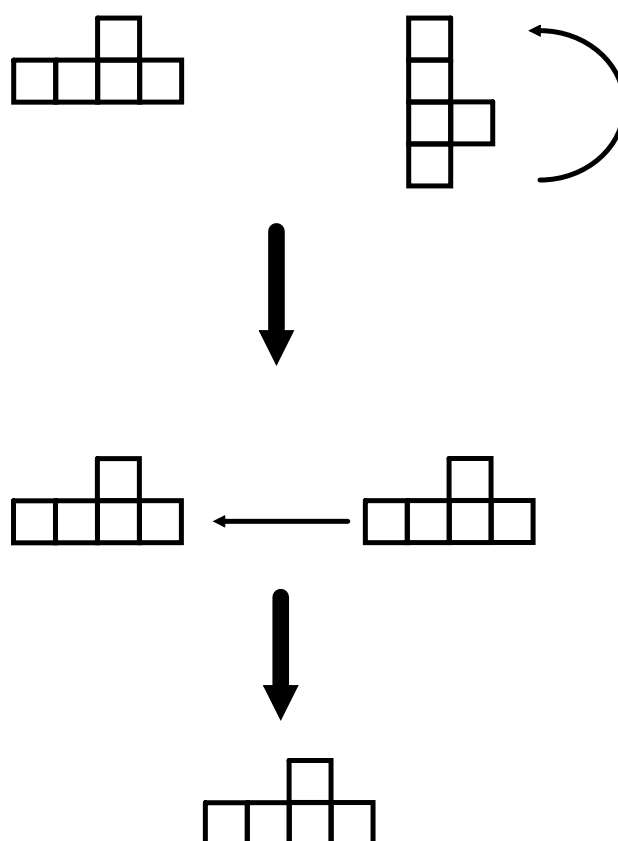
IXL Practice

**Level G - Symmetry and
Transformations - X.1
Lines of Symmetry and
X.6 Identify Congruent
and Similar Figures**

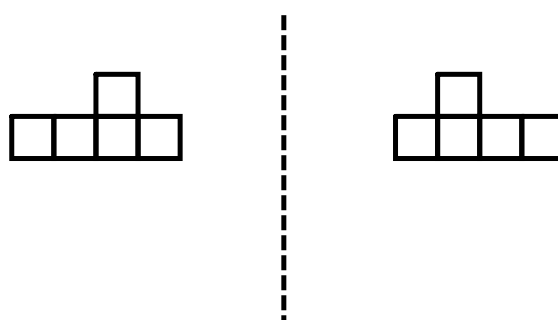
Congruence

Congruent shapes have the same size and shape.

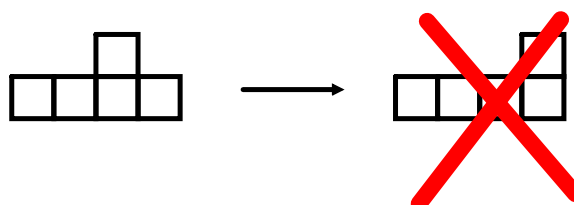
Hint: If you put congruent shapes on top of each other, they should match exactly.



Mirror images work as well.



However, different shapes and sizes don't.



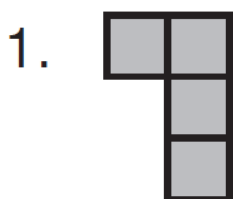
The only things that matter in congruence are **size and shape**.

Hint: Position, colour, pattern, and thickness of lines do not matter.

Exercises:

Which shape is congruent to shape a? 1, 2, or 3? **The Answer is 1! Just spin a and you will get 1.**

a)



2.



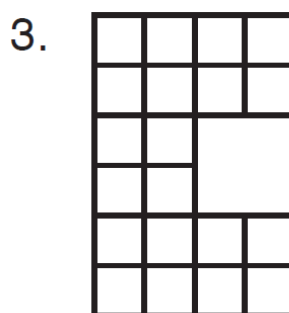
3.



Remember: Shading doesn't matter.

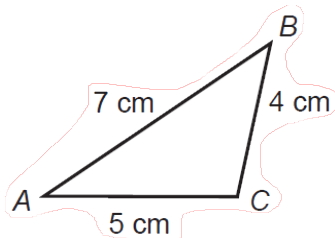
Which shape is **congruent** to shape b? 1, 2, or 3?

The answer is 2! b is the mirror image of 2.

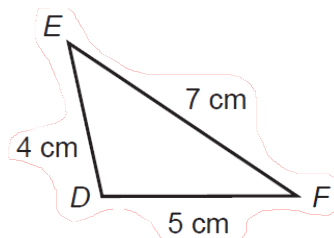


Which two triangles are **congruent**?

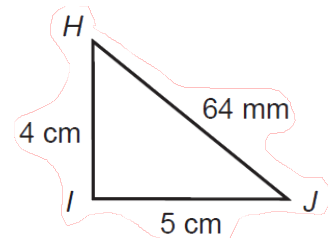
Triangle 1



Triangle 2



Triangle 3



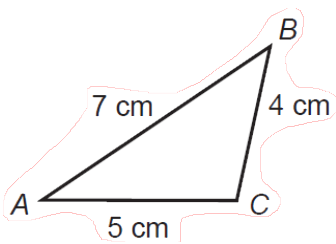
--- **Congruent polygons** have to have sides that are the same lengths. ---

So that means Triangle 1 is congruent with Triangle 2.

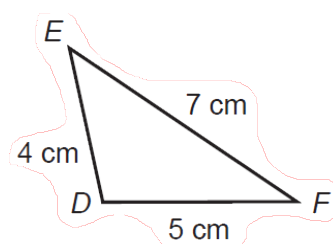
The angles of **congruent polygons** are also the same size.

Which angle in Triangle 1 is equal to which angle in Triangle 2?

Triangle 1



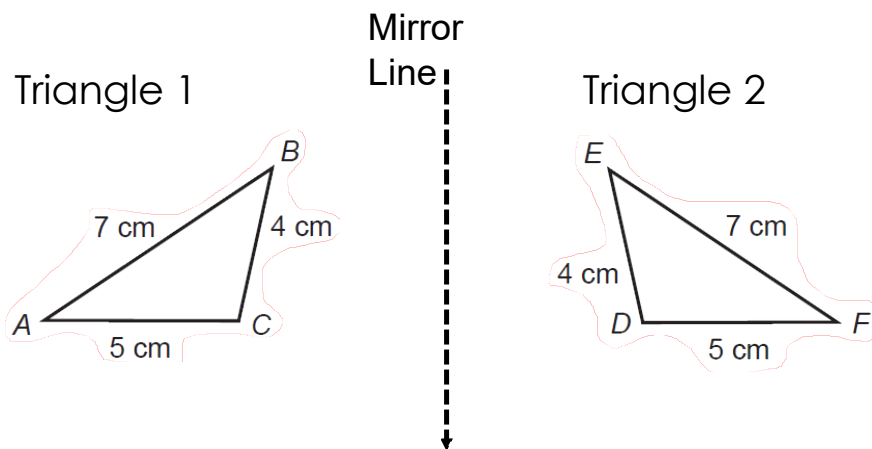
Triangle 2



To check that the equal sides of the triangles are identified correctly, imagine placing one on top of the other so the sides match.

For each pair in the previous exercises, what do you need to do with one triangle to get the other?

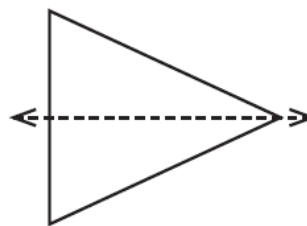
Create the mirror image!



Symmetry

Review:

If I were to fold this picture along the dashed line, what would happen?



Shapes that are exactly the same size and shape are called **congruent**.

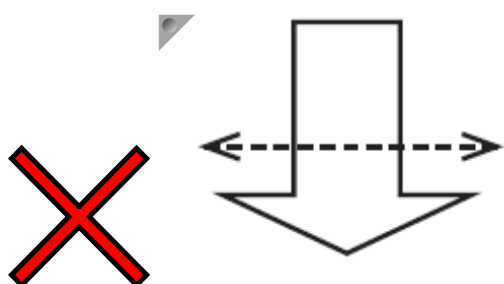
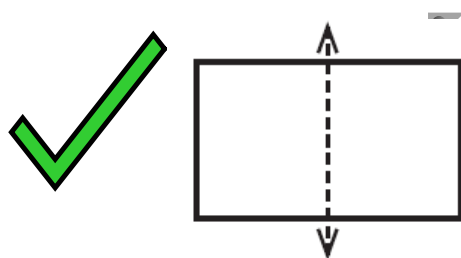
A line that divides a shape into two **congruent** parts that match exactly is called **a line of symmetry**.

Shapes that have this line are called **symmetrical**.

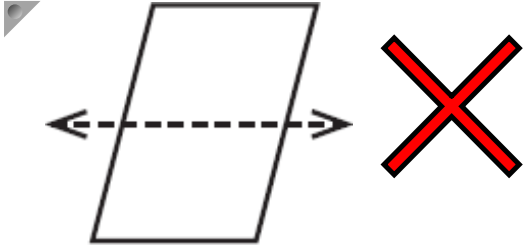
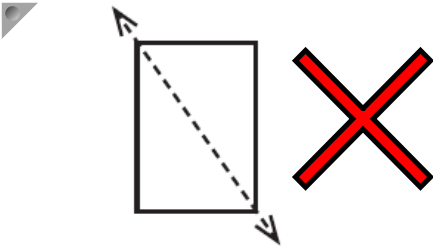
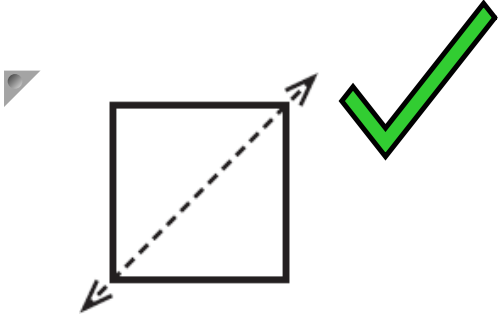
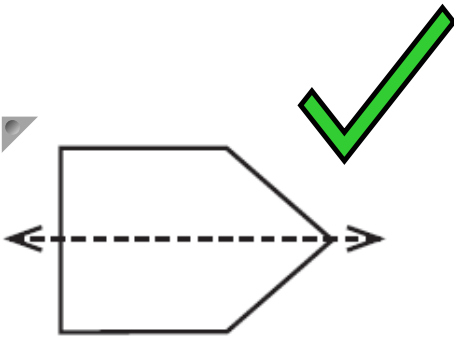
Lines of Symmetry

The line of symmetry can be defined as the axis or imaginary line that passes through the center of the shape or object and divides it into identical halves or mirror images of each other.

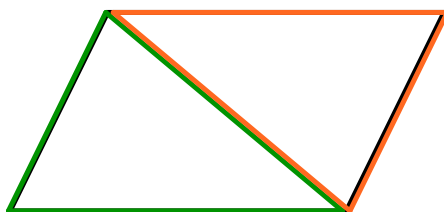
Is the dashed line a **line of symmetry**?



If not, does the shape have a **line of symmetry** at all?

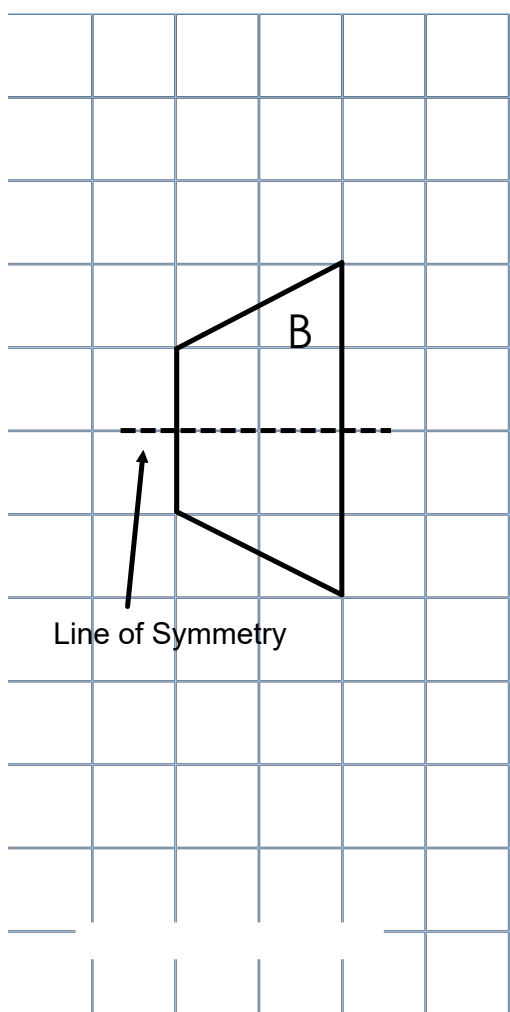


Most parallelograms **do not have a** line of symmetry, but they are made from two congruent triangles.



The triangles aren't mirror images.

You get from one to the other by a half-turn, or a turn of 180° .



Does this **polygon** have any ...

- equal sides?

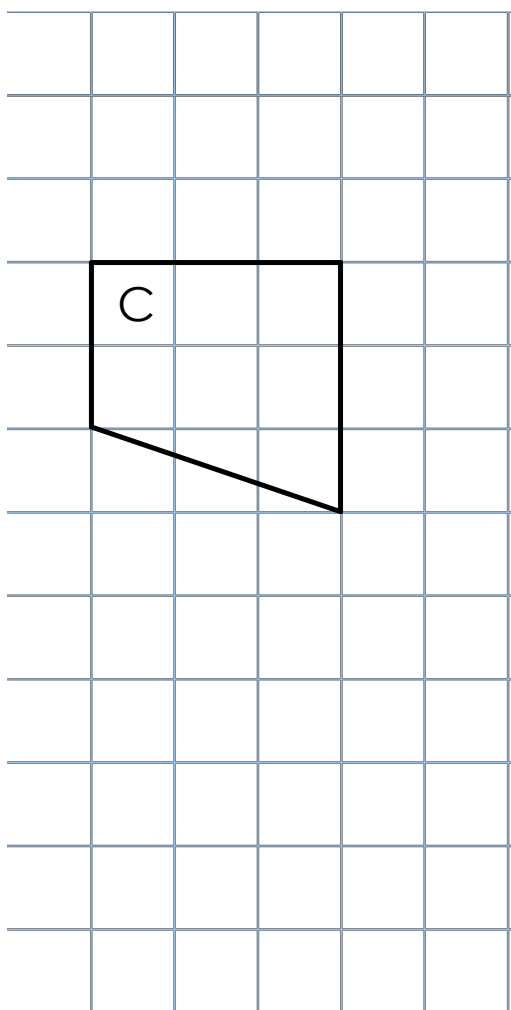
Yes! Two pairs of equal sides

- equal angles?

Yes! Two pairs of equal sides

- **lines of symmetry?**

Yes! One line of symmetry marked by the dotted line.



Does this **polygon** have any ...

- equal sides?

Two three-unit long sides

- equal angles?

Two 90 degree angles.

- **lines of symmetry?**

No. No matter where you place a line, you cannot create a symmetrical image on the other side.