

## Classifying Quadrilaterals

This project is all about exploring quadrilaterals!

There are 2 parts to this project:

(1) Create a “fact file” for each type of quadrilateral. It must include:

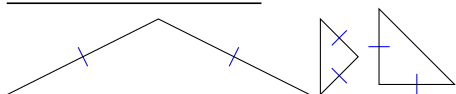
- The name of the quadrilateral
- An accurate drawing of a few examples
- Its definition
- At least one property about its edge lengths
- At least one property about its angles

You may choose to include more information, such as properties of its diagonals, area, symmetry, and etymology.

(2) Create a Venn-like diagram which demonstrates the relationship between different types of quadrilaterals

Here is an example of a very advanced fact file for isosceles triangles:

### Isosceles Triangle



An **isosceles triangle** is a triangle where at least two of its sides are equal.

Note: often, the side length which is not equal is called the “base,” if there is no confusion otherwise.

Etymology: “Isosceles” comes from the Greek roots *isos* (*equal*) and *skelos* (*leg*).

Properties:

- At least two side lengths are equal.
- Angles that are opposite equal side lengths are equal.
- Every isosceles triangle has at least one line of symmetry. Only the special case of an equilateral triangle has a different number of lines of symmetry.
- The altitude to the base (as defined above) satisfies several properties:
  - it is the perpendicular bisector of the base
  - it is the angle bisector of the angle opposite the base
  - it is a line of symmetry
  - it is the median of the triangle
- As with all triangles, its height is given by  $bh/2$  where  $b$  is its base and  $h$  is its height. There is no easy formula for area of an isosceles triangle in terms of its side lengths (a complex formula can be found as:  $b\sqrt{4s^2 - b^2}/4$ , where  $s$  is the length of the equal sides).

Below is an example of a Venn-like diagram which demonstrates the relationship between different types of triangles. Notice that the region representing a particular type of triangle is itself that type of triangle!

