§2.2 Triangles

In Grades K and 1

Identify and describe shapes (squares, circles, triangles, hexagons, cubes, cones, cylinders and spheres).

Analyze, compare, create, and compose shapes

Reason with shapes and their attributes.

Our definitions and language become generally more sophisticated.

1. Shape with 3 sides
2. Region enclosed by 3 line segments
3. A triangle consists of 3 non-collinear points, called vertices, and the line segments joining them, called the sides.

Note: Meaning has changed. Def^{n} 3 does not include the interior.

Sum of Angles of a Triangle

The sum of the interior angles of a triangle is 180° ($\angle$s in a $\triangle$)

We will present two justifications of this fact

1. Dissection. Cut up a triangle and assemble the interior angles to form a straight angle.

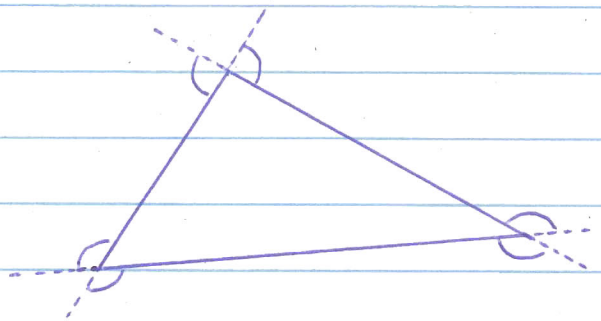
2. Right angle triangle teaching sequence.

    1. Show that in a right triangle the sum of the other angle is 90° ($\angle$s in a right $\triangle$).

    2. Show that any triangle can be split into two right triangles.

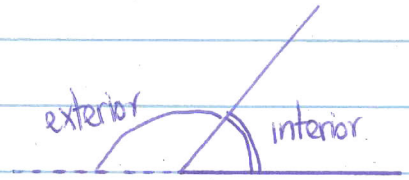
Exterior Angles

An angle formed by one side of a triangle and the straight extension of another side is called an exterior angle

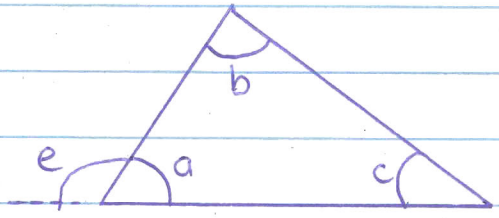


At each vertex there are 2 different exterior angles however their measures are equal (why?)

The interior angle and the exterior angle at a vertex are supplementary



For a triangle



$a + b + c = 180^\circ$

$a + e = 180^\circ$

$b + c = 180^\circ - a = e$

The measure of an exterior angle

of a triangle is the sum of the meaures of the opposite two interior angles.

This can be seen from our dissected triangle