Gymnázium, Brno, Slovanské nám. 7

WORKBOOK

http://agb.gymnaslo.cz

Subject: **Mathematics**

Student: .....

School year: ...../.....

Topic: **Plane geometry**

Areas and circumferences of geometric figures

What is a geometric figure?

- It is a geometric formation
- I has to be surrounded by a closed line, which is part of the figure too

What is circumference?

- We can understand it by the lenght of the boarders of the figure
- Polygon is surrounded by a polygonal line, which is composed of line segments so its circumference is a sum of the lenghts of these line segments

- In a case of circle, the circumference is the lenght of the circumference of the circle

What is an area?

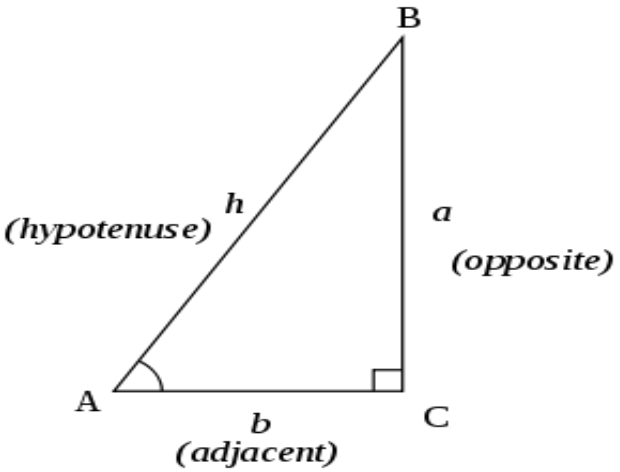
- It is a plus number, it fits with a geometric figure which means that:
- Identical figures have the same circumferences
- If the circumference is composed of many figures, which do not overlap themselves, its circumference equals its sum of areas

Triangle

Circumference: o= a+b+c

Area: $S=1/2av_a = 1/2bv_b = 1/2cv_c$

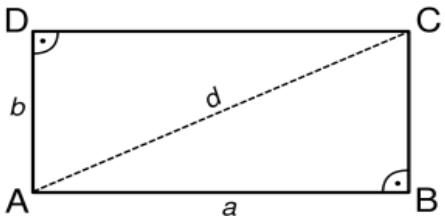
Heron´s formula: $Area = \sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{a+b+c}{2}$



Rectangle

Circumference: $o=2(a+b)$

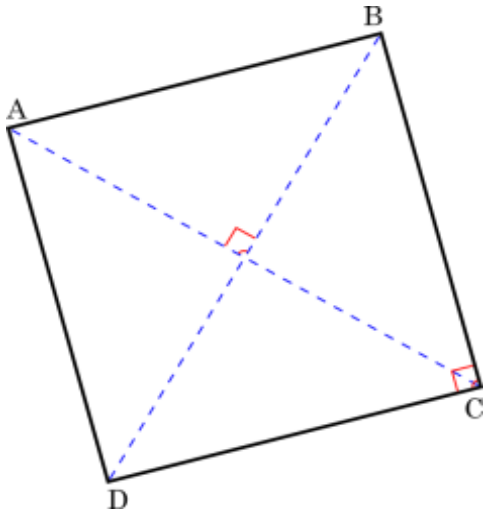
Area: $S=ab$



Square

Circumference: $o=4a$

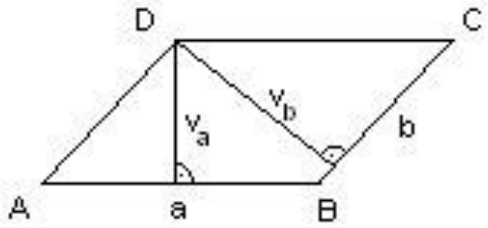
Area: $S=a^2$ $S=1/2e^2$



Rhomboid

Circumference: $o=2(a+b)$

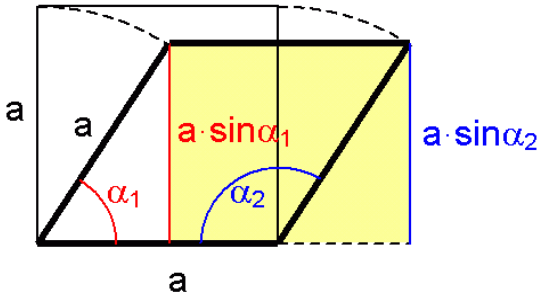
Area: $S=av_a=bv_b$



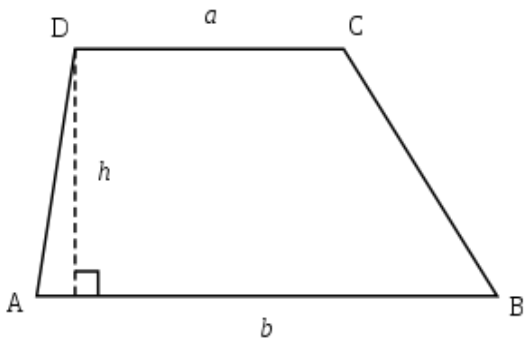
Rhomb

Circumference: $o=4a$

Area: $S=av$ $S=1/2ef$



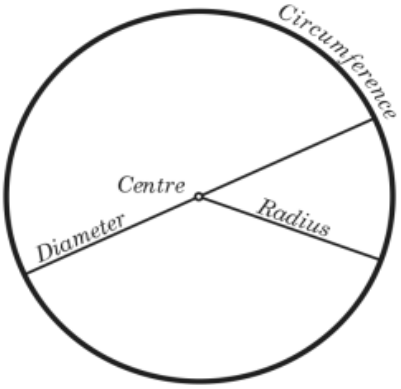
Trapeze



Circumference: $o=a+b+c+d$

Area: $S=1/2(a+b)v$

Circle



Diameter: $d=2r$

Circumference: $o=2\pi r=\pi d$

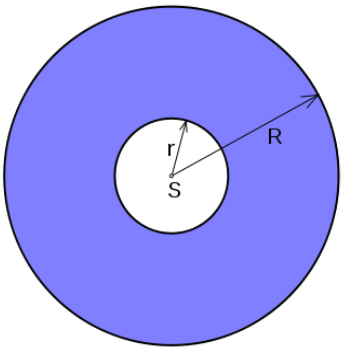
Area: $S=\pi r^2=1/4\pi d^2$

Annular area

Diameter: $d_1=2r_1$

$d_2=2r_2$

Area: $S=\pi(r^2_1-r^2_2)$ $S=1/4\pi(d^2_1-d^2_2)$



Quadrilaterals – vocabulary rewiew

kite	A quadrilateral with exactly two distinct pairs of adjacent congruent sides.
rhombus	A quadrilateral with parallel opposite sides
diagonal	A segment joining two nonconsecutive vertices of a polygon.
square	A parallelogram with four right angles.
trapezoid	A quadrilateral with exactly one pair of parallel opposite sides.
rectangle	A parallelogram with four congruent sides.
median	A parallelogram with four congruent sides and four right angles.
parallelogram	A segment that joint the midpoints of the leg sof a trapezoid
isosceles trapezoid	A quadrilateral with exactly one pair of parallel sides and exactly one pair of congruent sides

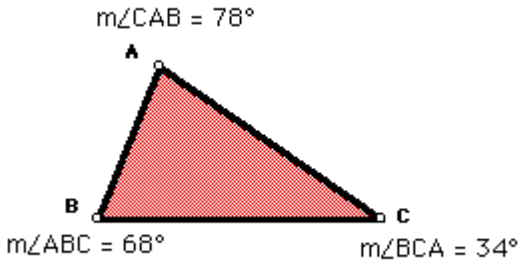
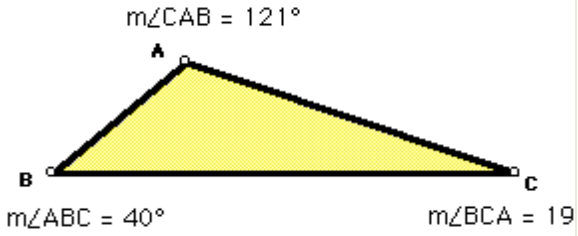
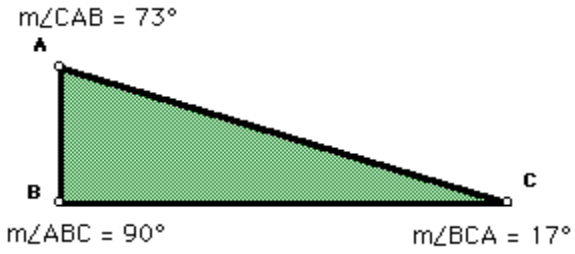
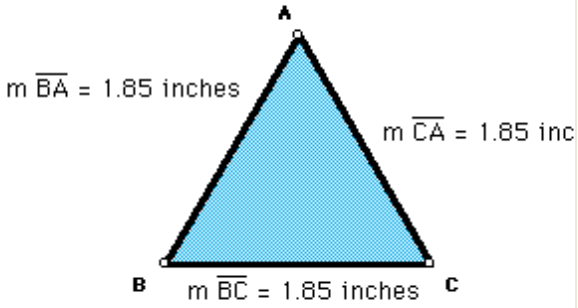
TRIANGLES

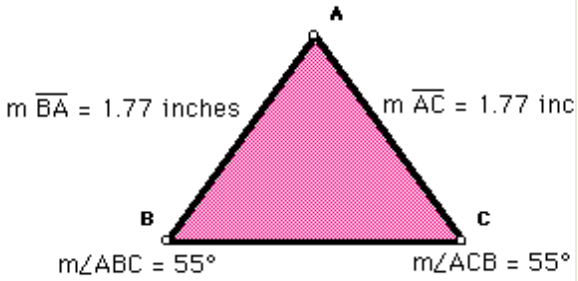
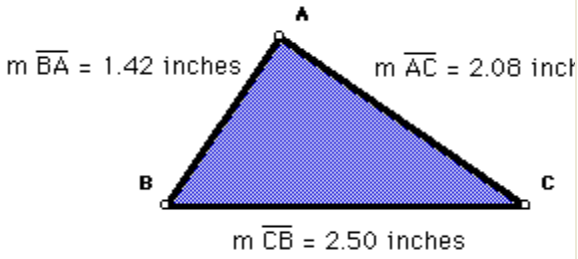
A **triangle** is one of the basic shapes of geometry: a polygon with three corners or vertices and three sides or edges which are line segments. A triangle with vertices *A*, *B*, and *C* is denoted $\triangle ABC$.

In Euclidean geometry any three non-collinear points determine a unique triangle and a unique plane

There are many different kinds of triangles.

The following table outlines some basic types of triangles.

	**Acute trianlges** are triangles in which the measures of all three angles are less than 90 degrees.
	**Obtuse triangles** are triangles in which the measure of one angle is greater than 90 degrees.
	**Right triangles** are triangles in which the measure of one angle equals 90 degrees.
	**Equilateral triangles** are triangles in which all three sides are the same length.

	**Isosceles triangles** are triangles in which two of the sides are the same length.
	**Scalene triangles** are triangles in which none of the sides are the same length.

Some Definitions

vertex of a triangle: the point at which two sides of a triangle meet.

altitude of a triangle: the perpendicular segment from a vertex of a triangle to the line containing the opposite side.

base of a triangle: the side of a triangle to which an altitude is drawn.

height of a triangle: the length of an altiutde.

Uses:
http://www.mathsisfun.com
http://www.mathopenref.com/planegeometry.html
http://library.thinkquest.org/2647/geometry/glossary.htm
http://www.vitutor.com/geometry/plane/area_perimeter.html