

GRUPO DE TRABAJO MICROSECUENCIAS AICLE.
2018/19.

CORDOVEAN PROPORTION

MATHEMATICS 1º ESO

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KEY COMPETENCES

Lingüitic communication

- To know, acquire, widen and improve the vocabulary.
- To practise comprehensive reading about texts related to the topic of the unit.

Mathematic competence

- Issuing judgments about making calculations Give opinion about mathematical operations
- To use mathematic and algebraic expressions
- To resolve mathematic problems using mathematic reasoning

Digital competence

- To use the calculator and computer to do the different tasks.

DIDACTIC ASPECTS

OBJECTIVES

- To appreciate the scientific knowledge as an integrated learning which is structured in different subjects as well as know and widen the mathematic methods to identify the problems in the diverse fields of knowledge and experience.
- To understand and express themselves in one or more foreign languages in a suitable way.

CONTENTS OF THE COURSE/STAGE

- 1. Common contents related to the problems solving and use of different tools.
- 4. Geometry.

TOPIC

- Geometric vocabulary
- Poligons
- History of Geometry

TASKS

- Activities to acquire the specific vocabulary
- Exercises to search information about the topic
- Set of problems about triangles
- Presentations of the projects to their partners. (digital or paper)

ASSESSMENT CRITERIA

- To recognise aa angle
- To use the fundamental relation of Geometry
- To find out all the trigonometrical reasoning of an angle using one of them.

OBSERVATIONS

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- The proposed activities can be used as a review, at the end of the unit or mixing the sessions once the concept in the mother language have been explained.
- Attention to diversity
- Extensionn: WRITING WORD PROBLEMS
- Reinforcement: USING YOUR CALCULATOR

CLASS 1 VOCABULARY PRACTICE

1. **Word Search.** Find SEVEN words and expressions related to geometry. Work in pairs.

X	R	Y	S	F	C	H	L	O	X	M	G	C	D	G
R	G	M	V	B	F	V	I	I	D	P	X	F	O	F
E	T	Y	U	R	H	B	N	B	S	O	D	B	I	E
R	F	D	E	E	T	H	E	X	A	G	O	N	U	A
Y	V	A	F	K	R	F	U	F	D	P	B	D	Y	P
U	M	F	V	H	A	B	R	X	U	W	T	P	T	D
I	N	G	B	G	F	C	D	S	S	S	U	O	R	A
L	P	R	N	C	H	A	L	M	E	D	S	S	F	D
S	O	I	M	R	C	Z	A	N	G	L	E	Z	B	G
D	L	M	K	Y	Y	R	H	U	M	L	F	V	H	J
Q	Y	P	U	H	U	A	C	B	E	I	G	W	K	I
K	G	S	T	N	F	D	N	M	N	T	B	P	B	T
C	O	M	P	L	E	M	E	N	T	A	R	Y	R	R
B	N	E	J	L	I	N	P	T	V	B	N	N	C	W
E	R	T	M	R	M	Ñ	F	I	N	L	B	E	R	Q

CLASS 2 WE MUST LEARN... POLIGONS AND THE CORDOVAN ARCHITECTURE

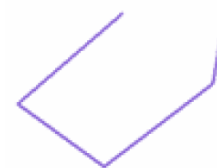
POLIGONS. A POLYGON IS A PLANE CLOSED SHAPE WITH THREE OR MORE STRAIGHT SIDES.



Polygon
(straight sides)






Not a Polygon
(has a curve)






Not a Polygon
(open, not closed)

TRIANGL

- A triangle is a polygon with three sides.
- Triangles can be classified in different ways:

TRIANGLES BY THEIR SIDES		
		
ISOSCELES	EQUILATERAL	SCALENE
It has two equal sides	It has three equal sides	It has three different sides

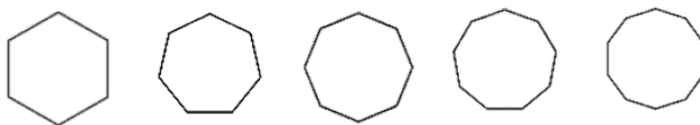
2.

TRIANGLES BY THEIR ANGLES		
		
ACUTE ANGLED TRIANGLE	RIGHT ANGLED TRIANGLE	OBTUSE ANGLED TRIANGLE
It has three acute angles	It has one right angle	It has one obtuse angle

POLYGONS

- Look for information and complete this chart with the characteristics of the polygons.

Regular polygons



<i>Name</i>					
<i>Number of sides</i>					
<i>Number of triangles the shape splits into</i>					
<i>Sum of the interior angles in the shape</i>					
<i>Size of one interior angle</i>					

INTERIOR ANGLE SUM OF ANY POLYGON

- You can divide any polygon into triangles by drawing diagonals from a vertex (corner).
- The number of triangles is always two less than the number of sides.

For a polygon with n sides the interior angle sum = $(n - 2) \cdot 180^\circ$

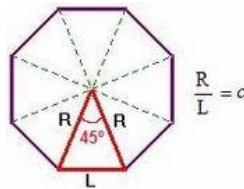
CURIOSITY

CLASS 3 WE MUST LEARN... POLIGONS AND THE CORDOVAN ARCHITECTURE

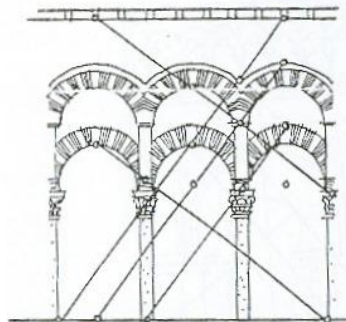
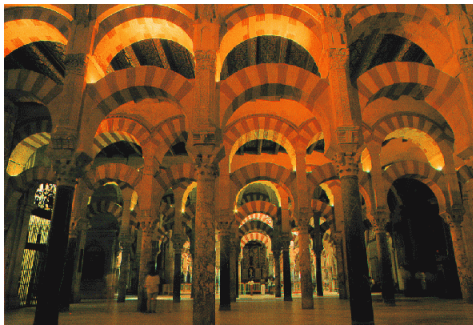
THE CORDOVAN PROPORTION

- The Cordovan triangle is an isosceles triangle whose equal sides with a measure R , and its unequal side have a measure L , they are in the proportion.

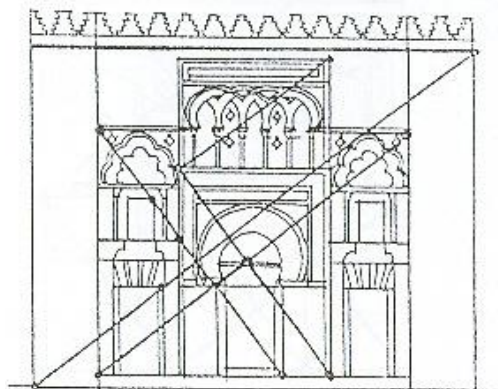
$$c = \frac{R}{L} = \frac{1}{\sqrt{2 - \sqrt{2}}} = 1,306562964\dots$$



- This proportion was discovered to Rafael de la Hoz Arderius (1924-2000), one of the most important architect of this time. He lived in Córdoba during his studies the reasons in the dimensions of the Mosque of Cordoba and other Arab designs in Andalusia, where it was repeatedly found with that number.
- While the golden ratio is that between the side and the radius of the decagon, the Cordovan proportion is the ratio between the radius of a regular octagon and its side.
- Mezquita de Córdoba/ Cordoba Mosque**



- Alhaken II Facade of Cordoba Mosque/Mezquita de Córdoba**



- Search online who was the promoter of the Cordovan proportion and name some current building where I use it. Then, comment with your classmates. (The projects can be done in class with the teacher's help and they will be explained to their partners).