

Visual Mathematics in Practice

Name of the teacher:	Tatjana Stanković
Name and address of the school:	ETŠ "Nikola Tesla", Maksima Gorkog 7, Pančevo, Serbia
Theme of the lesson:	Trigonometry Graphs of trigonometric functions, properties
Place in curriculum: (type of school, grade)	The secondary school of electrical engineering 1st grade
Age of the students/pupils:	15-16
Title of the lesson:	Graphs of trigonometric functions, properties

Description of the lesson-2nd part

Time	Exercises, matters, parts of the lesson	Methods and forms of student activities	Developable competencies
≈10min	Discussion and final conclusions based on the experience gained by using GeoGebra in previous lesson	work in pairs or in groups	Mathematical thinking (analysis, synthesis, analog thinking...) Problem posing and solving (flexibility of thinking,

≈30min

Graphing
trigonometric
functions

$y = -2\sin x + 1$,
 $y = 2\sin x$, $y = \sin(x - \pi/2)$,
 $y = -\cos(x - \pi/2)$,

$y = \sin(x + \pi/3)$,
 $y = \sin 2x$, $y = \sin(x/2)$,
 $y = -\tan x$, $y = \cot(x + \pi/2)$
etc.

≈5min

Checking their
results by using
Geogebra

Homework:

to make a model or
a draw, or a game
with trigonometric
function (but with
some meaning, task
or purpose).

Teacher gave them
same ideas from
Summer School

Inspiration came
from:

Djurdjica
Takači, Ljiljana
Radović, Slavik
Jablan, Rinus
Roelofs, Andrea

pliability,
transferring...)

Modelling (looking
for connections)

Reasoning and
proofs (conclusion,
generalization,
effect relations...)

Representation
(image creating
skills, spatial
seeing...)

Symbols and
formalism
(associative and
reason-based
memory, thinking
in functions and
algorithms,
recognizing
relations...)

Using mathematics
aids and tools (IT
included)

Sollazo, Ruth
Matheus-Berr, Ilona
Oláhné Téglási,
Vesna Babović

Summary

It was very interesting, pupils wanted to present their conclusions, enjoyed working in pairs or groups.

Especially, they enjoyed doing their homework. They found it very interesting, challenging and it encouraged them to be creative.

I think that this lesson (both 1st and 2nd part) was very successful.

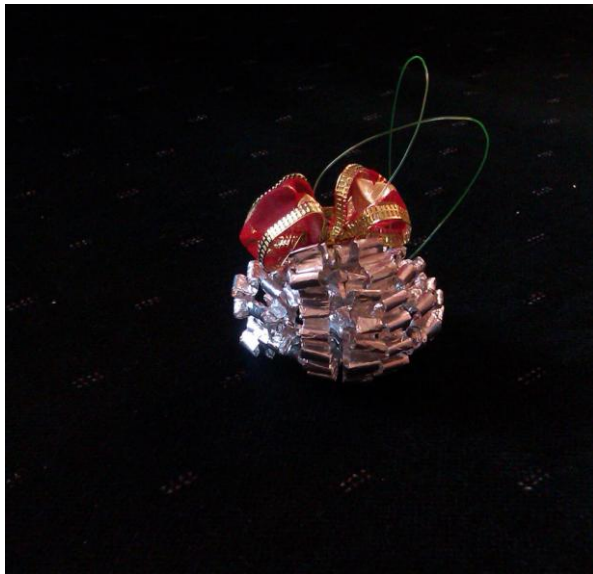
Supplements

Used materials: *Interesting photos from mentioned lectures
(Summer school)*

GeoGebra

Photos: *Here are some photos of their homework
(followed by description).*

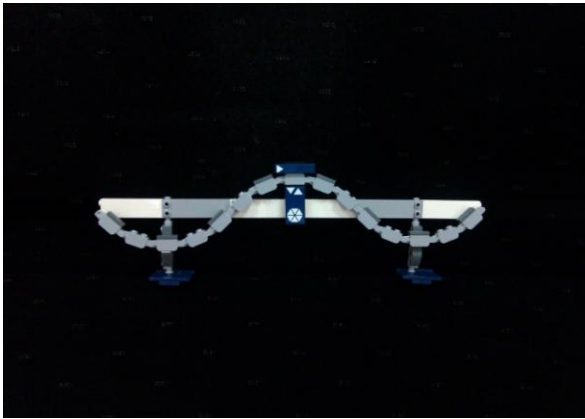
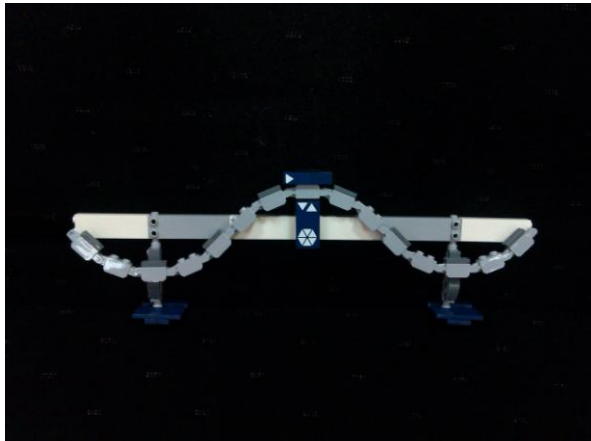
1. A model of Christmas tree decoration .



2. *Models of jewelry (earrings)*



3. *A model of function $y=\cos x$*

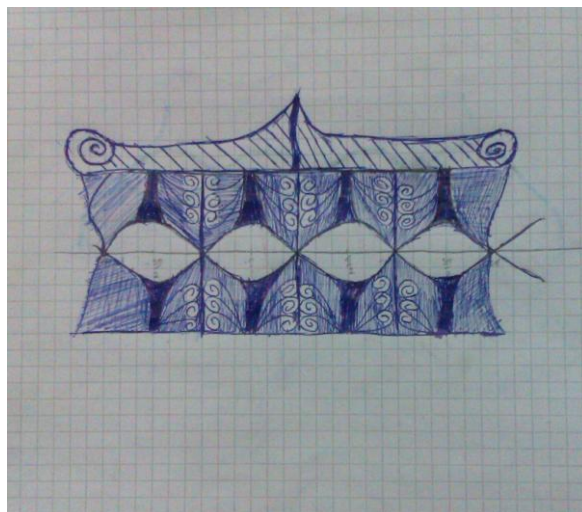
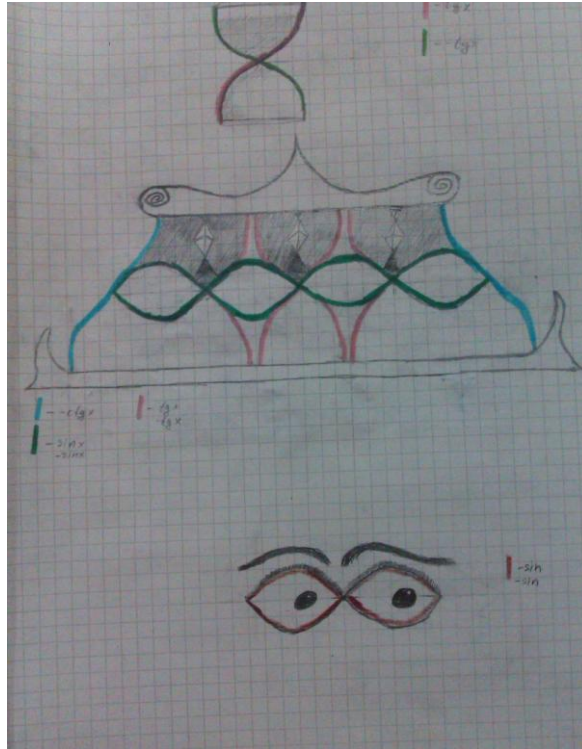


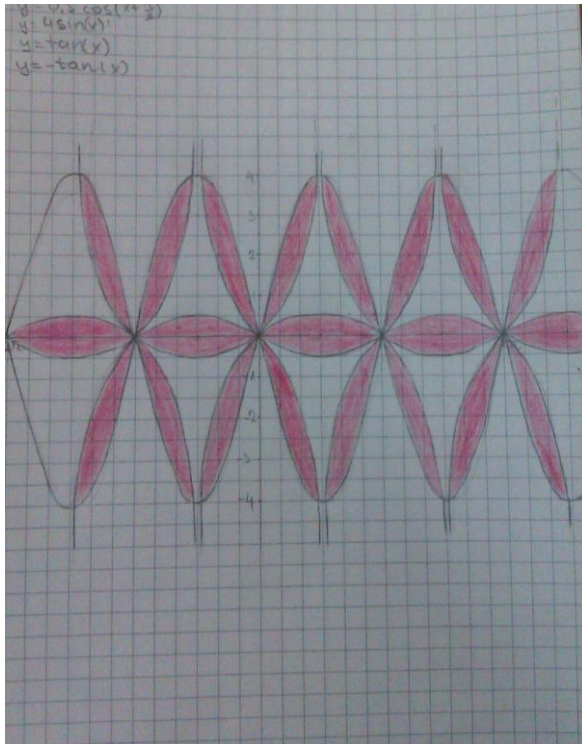
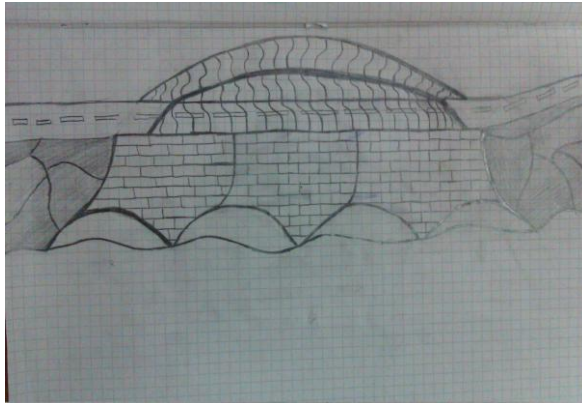


4. *A model of a bridge*



5. Drawings made by using functions





6. A game. Find given objects (in the up right corner) that are hidden on this

drawing.

