

## Studying math from surrounding world using GeoGebra

### Guideline for project "Math Is everywhere"

<http://new-twinspace.etwinning.net/web/p56717>

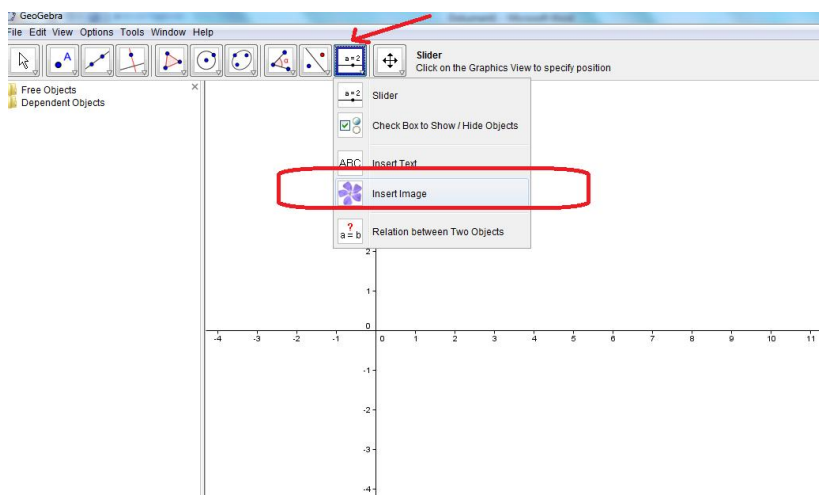
Eva Tšepurko (Estonia)- FOUNDER

Download the *GeoGebra* from <http://www.geogebra.org/cms/> or open it from your Desktop.

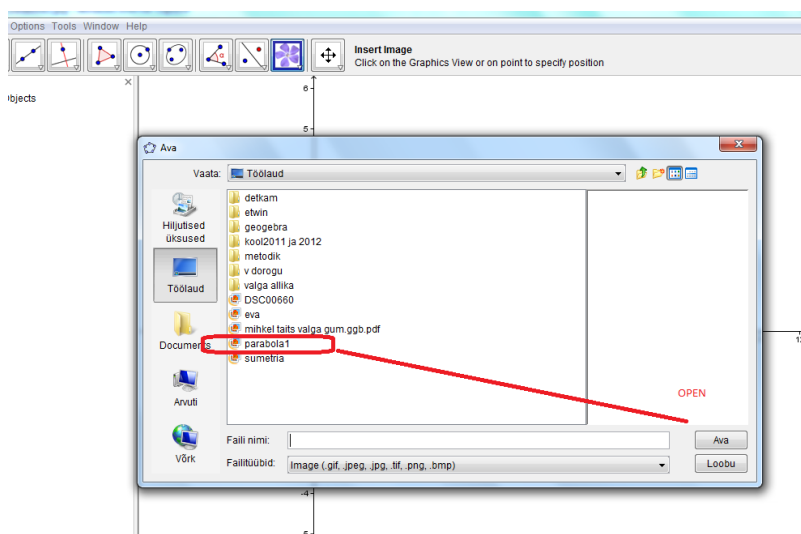
STEP1:

Now use this Picture us a background.

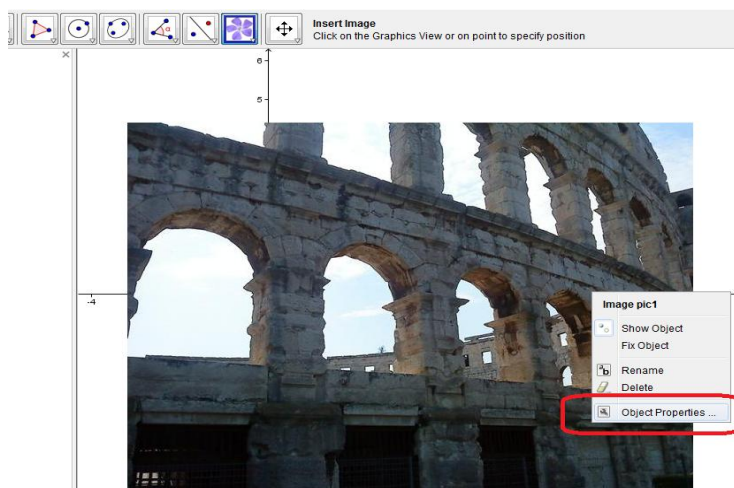
Add Picture by: *Insert Image*, us it shown on picture.



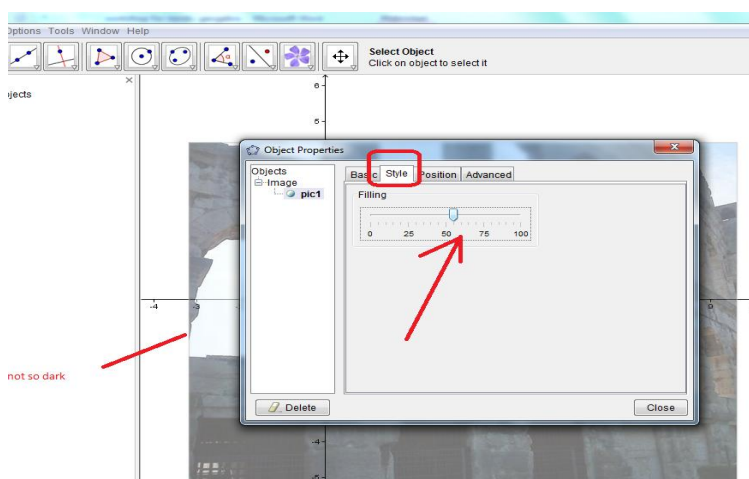
Click two times to left corner and choose saved fail from folder. Next push *Open* button



Now click on the picture, by the right button of the mouse and choose *Object properties*, to make picture lighter!




Chose *Style* and put between *50 and 75*



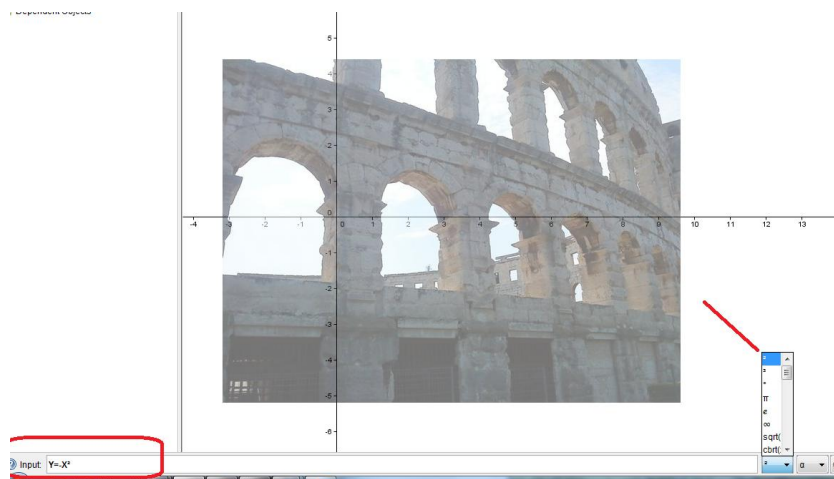
Now you can see an axis, and coordinate plane (if you wish).

STEP2:

Using button INPUT   $Y=-X^2$  put the frequency of quadruple function, or **parabola** that opens **down**.

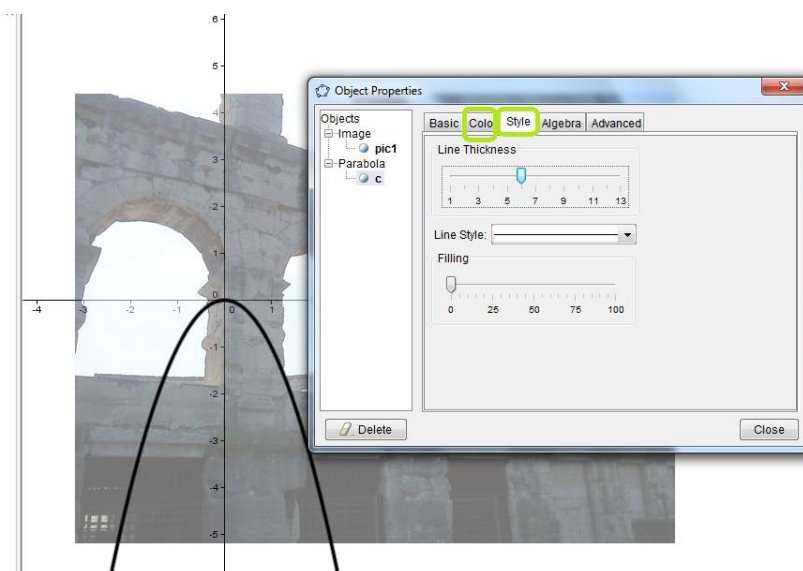
*Note:* in our everyday life more parabolas that open down, if student will find parabola that opens up, you can prime him. So parabola, in a Picture, opens down and first frequency is  $y=-x^2$





You can choose *order 2*, by button, us it chow on picture, or by multiply  $x*x$ . Put the *Enter*.

You can change, line thickness and color, by clicking on mouse right button, Object Properties-> *Style* or *Color* us it shown on Picture



As you seen parabola  $y=x^2$  don't match with picture! Do not fix the picture and do not use a mouse!

Only properties of quadratic function!!! Now the game starts!

Students must to remind what, quadratic function multiplier  $a$  at  $ax^2$  means, what happens if  $a$  grow and what happens if  $a$  increases?

So repeat a procedure by another *Windows of Amphitheater of Pula, Croatia*.

Do not use mouse! How parabola  $y=x^2$  can be moved to left or to right?  $(x-3)^2$  go to right and  $(x+3)^2$  parabola, goes to left.

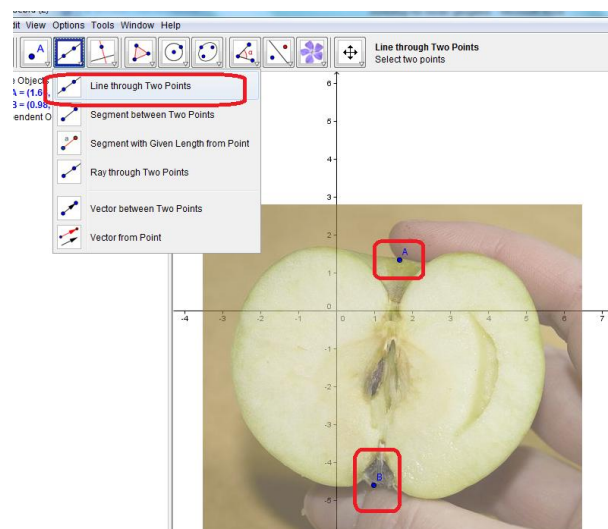
## Symmetry

Let's look, how we can approve that an apple is a symmetric

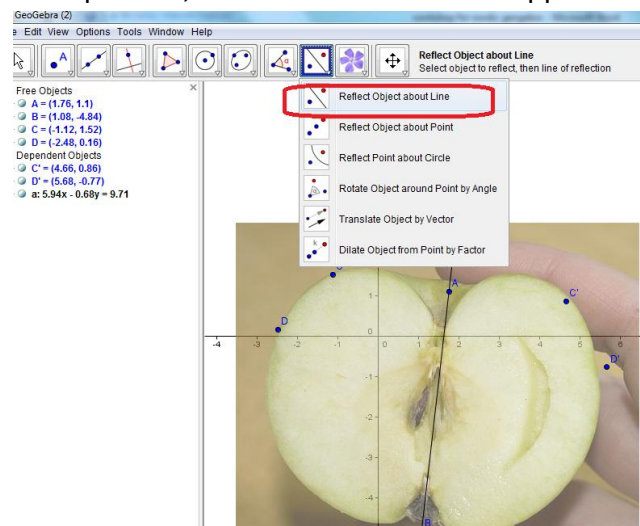


Add picture, make it lighter

Put 2 points A and B and draw an axis of symmetry by using *Line through Two Points*



Put a point C, to the one of half of an apple. Now try to use button *Reflect Object about line*.



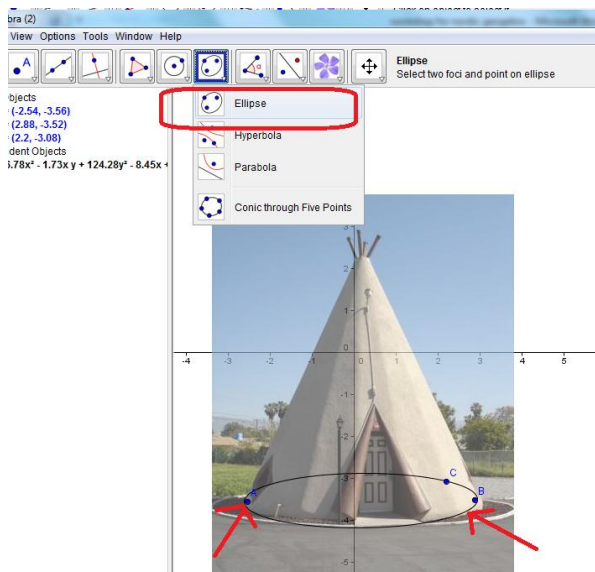
After that, try to use properties. By drawing perpendicular and measuring length or distance from point c to symmetry axis and to another half of apple.

*No we will draw a simulation how cone comes out.*

*Idea: "A cone is a three-dimensional geometric shape that tapers smoothly from a flat, usually circular base to a point called the apex or vertex. More precisely, it is the solid figure bounded by a plane base and the surface (called the lateral surface) formed by the locus of all straight line segments joining the apex to the perimeter of the base. The term "cone" sometimes refers just to the surface of this solid figure, or just to the lateral surface." [http://en.wikipedia.org/wiki/Cone\\_\(geometry\)](http://en.wikipedia.org/wiki/Cone_(geometry))*

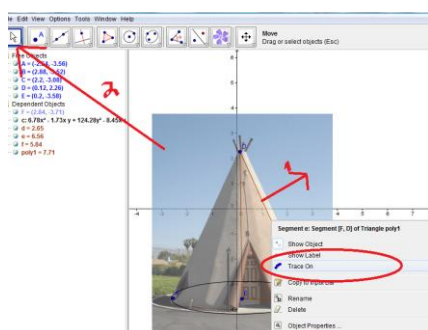
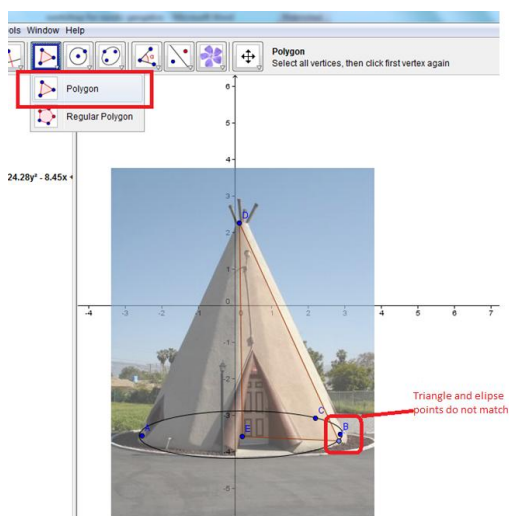


So let draw circular base or Ellipse, next we will draw triangle and after that we will rotate triangle by axis and leaved trace will be cone.



Now draw triangle but do not use ellipse points

Now by clicking on triangles side with right buttons of mouse, use *Trace on*. Change the mouse to arrow and rotate.



***If you liked idea, join our project***

***“Math is everywhere”***

