

Transformations of the Quadratic Function and Parabola - GeoGebra Dynamic worksheet - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://queensgeogebra.pbworks.com/f/transformations_worksheet.html

Transformations of the Quadratic Function and Parabola

On the graph below we have the functions
 $g(x)=x^2$ and $f(x)=a(x-h)^2+k$

Move the sliders for a, h, and k. What happens to the curve?

Free Objects

- a = 2.1
- $g(x) = x^2$
- h = -1.3
- k = -4.4

Dependent Objects

- $f(x) = 2.1(x + 1.3)^2 - 4.4$

Describe how changing a alters the parabola?

Describe how changing h alters the parabola?

Done

Using GeoGebra to Provide Online Exploration and Collaboration

OAME Annual Conference
May 12-14, 2011
University of Windsor

Geoffrey Roulet
Faculty of Education, Queen's University
geoff.roulet@queensu.ca

Using GeoGebra to Create Online Interactive Explorations

The following instructions lead through the steps to build a simple **Dynamic Worksheet as Webpage**.

Accessing GeoGebra

GeoGebra is open-source software and a copy can be downloaded on to your computer from:

<http://www.geogebra.org/cms/en/download>

The GeoGebra website (www.geogebra.org) also provides much support for users of the software.

GeoGebra is written in Java and can be run as a Web application if the software is not installed on the computer you are using. Go to <http://www.geogebra.org/cms/en/download> and click on 

Getting the Files Needed for this Workshop

Open a Web browser

Go to: <http://queensgeogebra.pbworks.com/>

Click: [Using GeoGebra to Provide Online Exploration and Collaboration](#)

Click: [Creating a Dynamic Worksheet](#)

Click: [GeoGebra.qgb](#) and **Open** if you have GeoGebra on your computer

or

Click: [GeoGebra.html](#) if GeoGebra is not installed on your computer.

A GeoGebra Tool for Investigating the Transformations of a Function

Pick a class of functions for which you would like students to investigate transformations, i.e. **quadratic functions**. Write the general function in a form that makes it relatively easy to link transformations with parameters, i.e. $y=a(x-h)^2+k$. In GeoGebra it is easy to create a tool that supports investigation of the impact of changing each of the parameters. The steps below continue with the quadratic example, but can be modified for any class of functions.

Adjust the axes to suit the example:

Move the cursor to the graph pane and:

Right-click > **Graphics View** > **Axes** > **x** and set x axis **min** and **max**
> **y** and set y axis **min** and **max**

Plot your function in base form, i.e. $y=x^2$

In the **Input Bar** type $g(x)=x^2$ and **Enter**

Create Sliders for the parameters:

For each parameter:

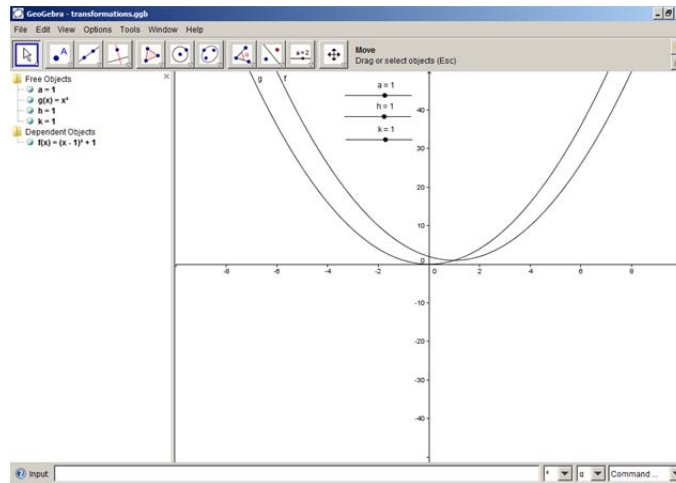
Click on the slider tool  and select **Slider**

Click on the graph window where you want the slider. Change the label to the appropriate letter, and **Apply**.

Enter the function in general form using the parameters:

In the **Input Bar** type $f(x)=a*(x-h)^2+k$ and **Enter**

File > Save As... your GeoGebra (.ggb) file



Having problems? If yes:

Click: [transformations.ggb](#) and **Open** if you have GeoGebra on your computer

or

Click: [transformations.html](#) if GeoGebra is not installed on your computer.

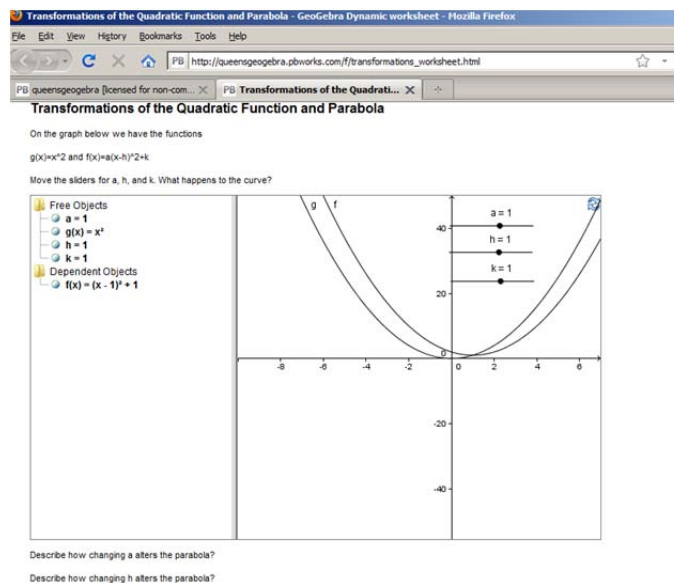
Creating the Dynamic Worksheet Webpage

Click: **File > Export > Dynamic Worksheet as Webpage (html) ...**

Add **Title**, **Text above the construction** providing instructions for students, and **Text below the construction** asking guiding questions.

Click **Advanced** and select appropriate **Functionality** and **User Interface** items
For this worksheet you likely want just **Show icon to reset construction**

Export



Click: [transformations_worksheet.html](#) to see a sample

Putting the Worksheet on the Web

Go to: <http://queensgeoqebra.pbworks.com/>

and **log in** to the wiki

Click **Pages & Files** >  **Worksheet Examples** >  and upload the html file

Click **Wiki** > **Using GeoGebra to Provide Online Exploration and Collaboration**

> **Creating a Dynamic Worksheet**

> **Dynamic Worksheet Examples**

Click **Edit**

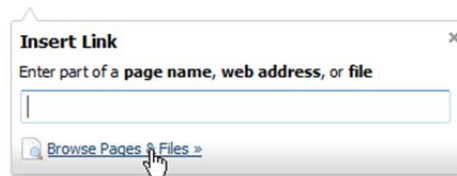
Add a **link** to the .html file for your worksheet by:

Click: 

Click: **Browse Pages & Files >>**

Browse to and select your file

Click: 



Save the wiki page

Using GeoGebra to Display and Share Student Work

The simple production of webpages displaying GeoGebra products provides students with a tool to display and share their mathematical work. Steve Phelps, a teacher at Madeira High School (Cincinnati, OH), has set up a wiki (<http://madeiramath2.wikispaces.com/>) where his students in the Honours Geometry course post their solutions to problems. Many of these involve the use of GeoGebra.

Go to: <http://madeiramath2.wikispaces.com/>

See the work posted by **Abby J** and **Andrea W**

Go to: <http://madeiramath2.wikispaces.com/3D> to see a screen cast by **Amy S** showing work in 3 D geometry using the beta version of GeoGebra 5.0 (<http://www.geogebra.org/webstart/5.0/geogebra-50.jnlp>).

Using GeoGebra to Support Collaborative Exploration and Problem Solving

By combining a wiki (PBworks) with GeoGebra we can set up an online environment for students to work collaboratively on mathematics problems.

For an example of this go to: <http://collabmath.pbworks.com/>

The diagram illustrates a collaborative problem-solving process on a wiki. It shows a sequence of pages and their corresponding GeoGebra workspaces:

- model of simple online collaboration**: A wiki page with a text description and a small graph. A large black arrow points to the next page.
- Bob's Ideas**: A wiki page with text and a GeoGebra workspace. The workspace shows a graph with a curve and a table with data points. A large black arrow points to the next page.
- Tom's alternative approach**: A wiki page with text and a GeoGebra workspace. The workspace shows a graph with a curve and a table with data points. A large black arrow points to the next page.
- Mary's extension**: A wiki page with text and a GeoGebra workspace. The workspace shows a graph with a curve and a table with data points. A large black arrow points to the next page.
- Tom's suggestion**: A wiki page with text and a GeoGebra workspace. The workspace shows a graph with a curve and a table with data points.

The data table in the 'problem start' and 'Tom's suggestion' workspaces is as follows:

	A	B
1	Distance L	Intensity
2		
3	20	0.01
4	10	0.04
5	7	0.08
6	5	0.14
7	3	0.32
8	1	1.25
9		
10		
11		
12		
13		
14		
15		