

# GeoGebra Basics

## *Handbook 5*

### A Guide for Learning GeoGebra


Dr. Robert E. Mason IV

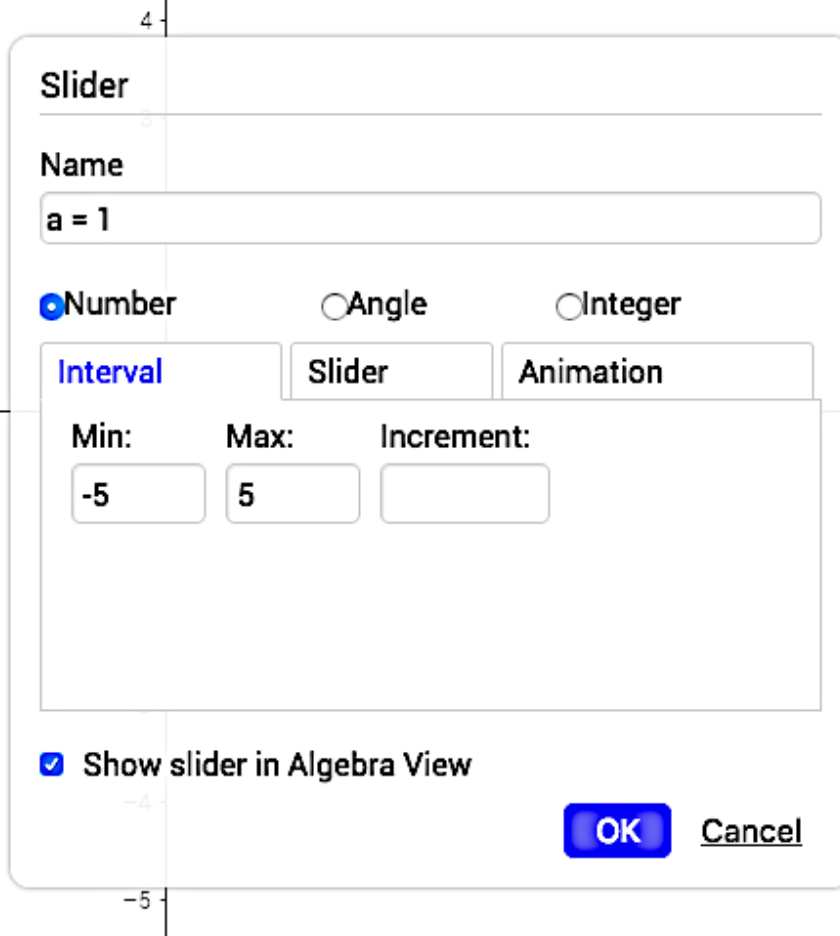
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# Sliders

## Creating sliders

1. Select the **Slider** tool from the **Construction Tools**: 
2. Click where you want to locate the slider. The following window will appear:



**Slider**

Name  
a = 1

Number     Angle     Integer

Interval    Slider    Animation


Min:    Max:    Increment:

-5    5   

Show slider in Algebra View

**OK**    Cancel

3. Click the **OK** button and a slider will appear.

4. Go to the **Construction Tools** and select the **Arrow** . Use the arrow to drag the point  $a$  on the slider. You will notice that value of point  $a$  on the slider will change.

Repeat steps 1 to 4 to create more sliders but rename them **k**, **p** and **q**.  
Click on the Input Bar on the top left side of the GeoGebra window:



Use the keyboard and the dropdown menus (next to the Input Bar) to type the equation (on separate screen) and press enter:

Input:  $y=a/(k+p)+q$

Input:  $y= -2k+q$

Input: your own equation using  $a$ ,  $k$ ,  $p$ , and  $q$ .

## Animating Constructions

**GeoGebra** offers the possibility to animate sliders (numbers, angles) and points on paths (segment, line, function, curve, etc.). While an animation is running,

**GeoGebra** remains fully functional. This allows you to make changes to your construction while the animation is playing.

Let's animate three points on three circles.

Step 1 Use the Circle with center through point tool. Put one point in the **Graphic View** screen. Then follow the instruction at the button of the view. Place a free moving point on the circle.

### Circles



Step 2 Do step one two more times to create two additional circles.

Step 3 Connect the three free moving points (C, H, and I) with segments.

The screenshot shows the GeoGebra interface with a list of objects on the left and a workspace on the right. The workspace contains three circles and three segments connecting points C, H, and I. The list of objects is as follows:

|                                  |                                 |   |
|----------------------------------|---------------------------------|---|
| <input type="radio"/>            | F = (6.6, 1.6)                  | ⋮ |
| <input type="radio"/>            | G = (8.3, 0.1)                  | ⋮ |
| <input type="radio"/>            | e : Circle (F, G)               | ⋮ |
|                                  | → $(x - 6.6)^2 + (y - 1.6)^2 =$ |   |
| <input checked="" type="radio"/> | H = Point (e)                   | ⋮ |
|                                  | → (5.5, 3.6)                    | ▶ |
| <input checked="" type="radio"/> | I = Point (d)                   | ⋮ |
|                                  | → (3.1, -1)                     | ▶ |
| <input type="radio"/>            | f : Segment (C, I)              | ⋮ |
|                                  | → 5.2                           |   |
| <input type="radio"/>            | g : Segment (I, H)              | ⋮ |
|                                  | → 5.2                           |   |

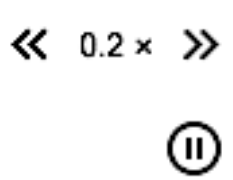
In order for us to animate our three points we select the animate button that is associate with each free moving point. The animate button looks like this



Figure 1- Animate Button

|                                  |               |   |
|----------------------------------|---------------|---|
| <input checked="" type="radio"/> | H = Point (e) | ⋮ |
|                                  | → (5.5, 3.6)  | ▶ |
| <input checked="" type="radio"/> | I = Point (d) | ⋮ |
|                                  | → (3.1, -1)   | ▶ |

Select the left double arrows to decrease the speed of the animation, and the right double arrow to increase the speed of the animation.

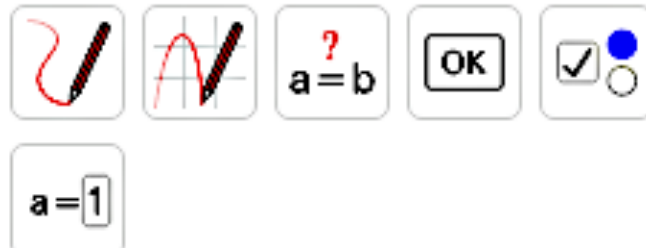


# Buttons

Buttons are meant to trigger scripts by being clicked. Although scripts can be triggered by clicking any other object (e.g. an image), using buttons for this makes your worksheet more intuitive.

Buttons can be created using the  **Button Tool** or the **Button Command**.

## Others



Buttons are connected to sliders.

First create a slider bar that animates a point on the x-axis.

Select the slider icon . Name = a

Interval: Min = 0, Max = 10, and Increment is 0.001.

**Slider**

Name  
a

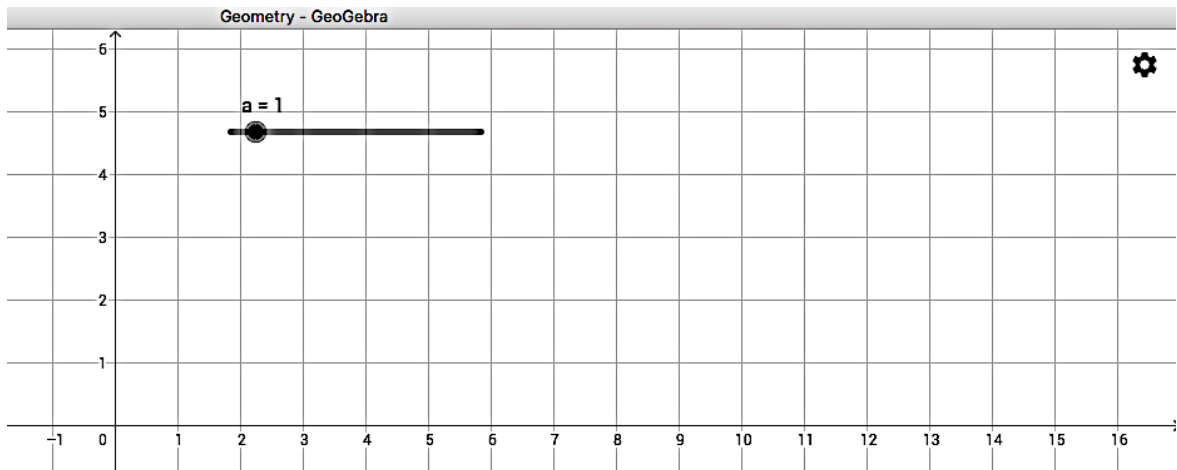
Number     Angle     Integer

| Interval        | Slider           | Animation                 |
|-----------------|------------------|---------------------------|
| Min<br><u>0</u> | Max<br><u>10</u> | Increment<br><u>0.001</u> |

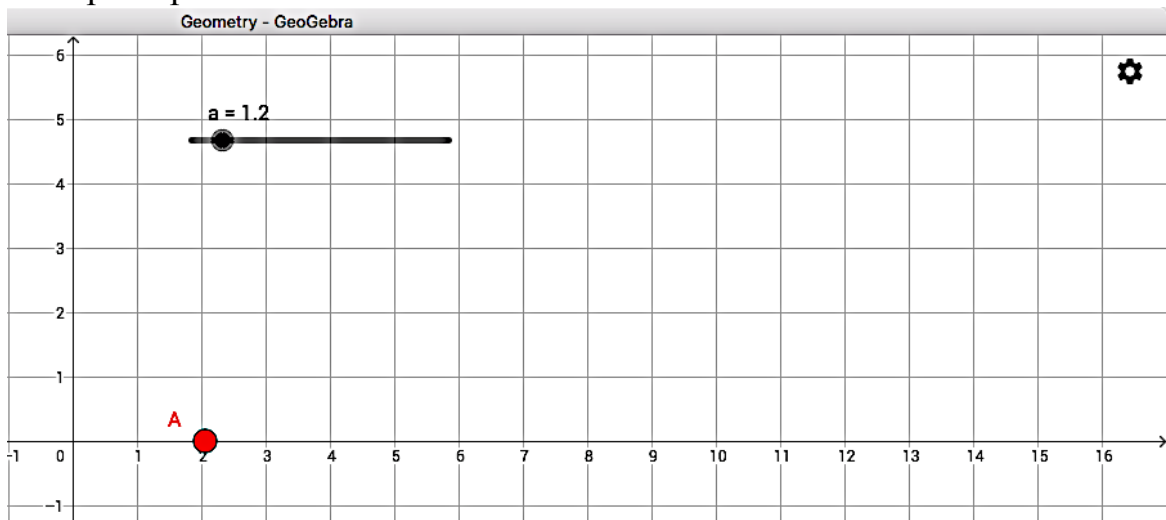
Show slider in Algebra View

OK    CANCEL

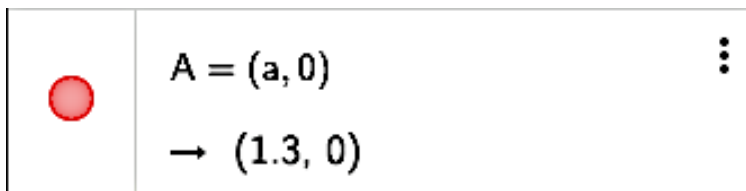
Click Ok. Your screen should look like the one below.



Now put a point on the x-axis



Now we must link (attach) **point A** to the **Slider (a)**. Do to this we use the **Input** tool.



Move the **Slider button** from left to right and watch what happens.




## Creating a Button

We create a button to animate the **point A** by using the button tool.



This is the button tool . When we click it, you will see the following display.



The dialog box is titled "Button". It contains a "Caption" label followed by a horizontal line for text entry. Below that is a "GeoGebra Script" label followed by a large rectangular text area for script entry. At the bottom right, there are two buttons labeled "OK" and "CANCEL".

Now fill in the information as follows:

Caption – **Animate**

GeoGebra Script – **StartAnimation[a]**. Enter it exactly as I have. Capital S and A, left and right square brackets. See example below.

### Button

Caption

**Animate**

GeoGebra Script

**StartAnimation[a]**

OK

CANCEL

The screenshot shows the GeoGebra Geometry window. On the left, the algebra view contains a slider for  $a = 4$  with a range from 0 to 15, and a point  $A = (a, 0)$ . On the right, the geometry view shows a coordinate grid with x-axis from 0 to 5 and y-axis from 0 to 4. A horizontal line segment is drawn at  $y = 2$  from  $x = 1$  to  $x = 4$ , with a point labeled  $a = 4$  at  $(2, 2)$ . A point labeled  $A$  is located at  $(4, 0)$ . A button labeled "Animate" is positioned on the grid at approximately  $(3.5, 3.5)$ .

We should make a **Stop** Animation button.

Click the button icon again.



**Button**

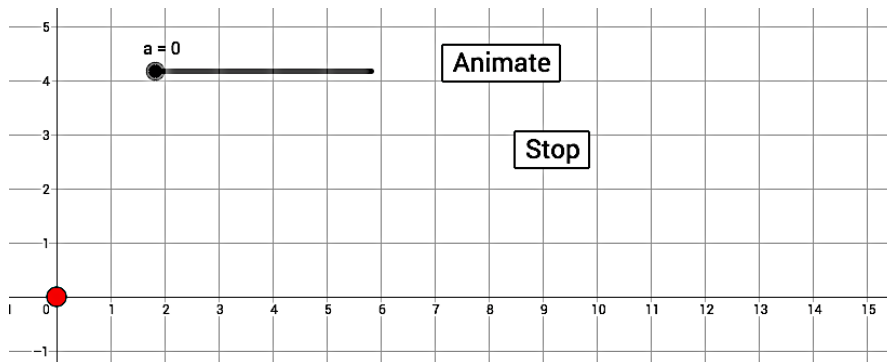
**Caption**  
Stop Animation

---

**GeoGebra Script**

```
StartAnimation[false]
```

OK CANCEL



### Dare to Think

1. Modify the animation to the  $x = 0$  and  $y$  varies.
2. Discover how to make  $x$  and  $y$  change during the animation.
3. Create a Reset button
4. Animate three points around a circle at the same time
5. Animate three points on three separate circles with on button