

GeoGebra Talk on 22nd February 2024

Workshop vs Presentation – the pros and cons

GEOmetry first then **alGEBRA**

Shared principles across both elements of the workshop as it is all one package.

Font size – everything changes!

VIEWS

Algebra – useful but you can turn off if you wish!

Graphics

Graphics2

3D graphics

Probability calculator

Input bar

GEOmetry

Right click on page

Hide grid

Hide axes

Loads of tools – each with a tool tip – read them – they're useful!

Key principle #1 – ctrl-z (or the undo arrow at top right of the screen) is a great mate!

Key principle #2 – a tool remains selected until you choose another tool!

If you wish to select something you must first choose the select tool – the arrow top left.

Draw two points

Move them around

Now draw a line which joins them using the segment tool.

Key principle #3 – right-clicking on an object allows one to change its properties

Play around with the attributes of points and lines – take note of **decorations**

Key principle #4 – whatever is selected is affected!

Key principle #5 – hold down CTRL to select multiple objects in turn – can also select by type in algebra panel.

Delete everything – CTRL A and press delete or backspace

Draw a line segment

Draw a point in free space and draw a point on the line

Try moving them both

Notice – one is **free** and one is **dependent**.

Delete everything – CTRL A and press delete or backspace

Draw two points and draw a line through them – not a segment!

Now draw another point

Now use the parallel line tool on the construction drop down to draw a line parallel to your line.

Draw in a transversal and mark the points of intersection.

Now measure a pair of corresponding angles using the angle measure tool on the measurement drop down.

Drag things around

Delete everything – CTRL A and press delete or backspace

Now let's draw a rhombus

Draw a circle

Draw two radii

Draw lines parallel to each of them

Key principle #6 - Hiding an object is different to deleting it!

Delete everything – CTRL A and press delete or backspace

Now let's draw a quadrilateral with line segments

Construct the Mid-points of the sides

Join them up

Hide the sides of the original quadrilateral but keep the vertices visible. Drag them around.

What do you notice?

Let's confirm this – by taking some measurements using two tools (length and gradient) on the measurement drop down.

Delete everything – CTRL A and press delete or backspace

Now let's draw a triangle

Measure the angles

Calculate the angle sum

Put some interactive text on the diagram

Delete everything – CTRL A and press delete or backspace

Now let's demonstrate angles in same segment of a circle

Draw a circle

Draw in a "bow-tie shape" with the points on the circle.

Measure two angles which are in the same segment

Draw the arcs – minor and major and shade them.

Show the segments with a checkbox!

alGEBRA

Show the axes

Show the grid

Draw $y=x^2$

Note: ^ for powers and * for times and sqrt for square root

Delete everything – CTRL A and press delete or backspace

Draw $f(x)=2x^3+5x^2-4x-3$

Scale the axes

Change the attributes of the graph – show the name and the label

Roots

Extremum

Inflection point

Delete everything – CTRL A and press delete or backspace

Type in a parabola and a circle in standard form

$$f(x)=(x+3)^2+2$$

$$(x-2)^2+(y+3)^2=9$$

Note how we can change their forms!

Delete everything – CTRL A and press delete or backspace

Draw $f(x)=x^2$

Draw $g(x)=f(x+2)$

Draw $h(x)=f(x)+2$

Draw $j(x)=-f(x)$

Draw $k(x)=f(-x)$

Show labels on all of these – hide some.

Unfix x and drag around.....

Delete everything – CTRL A and press delete or backspace

a=1

Draw $y=ax^2$

Try changing a

p=1

q=1

Draw $y=a(x+p)^2+q$

Try changing a, p and q

Delete everything – CTRL A and press delete or backspace

Draw $y = x^3 - x^2 - x + 1$

Put a point on curve

Calculate x value of point and store in e as follows $e=x(A)$

Calculate f' and f'' at e and store in g and s respectively

$g=f'(e)$ and $s=f''(e)$

Put dynamic text on the graph with the first and second derivatives

Create a new point, showing f'

$B=(e,g)$ and make it trace

Now create a new point showing f''

$C=(e,s)$ and make it trace

Delete everything – CTRL A and press delete or backspace

Model an optimisation problem