MathTools

GeoGebra Compendium

Classic for version 5

| Geometry | Functions | Box Plot | Constructions | | The Command Line |

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COMPENDIUM FOR GEOGEBRA VALID FOR THE CLASSIC VERSION

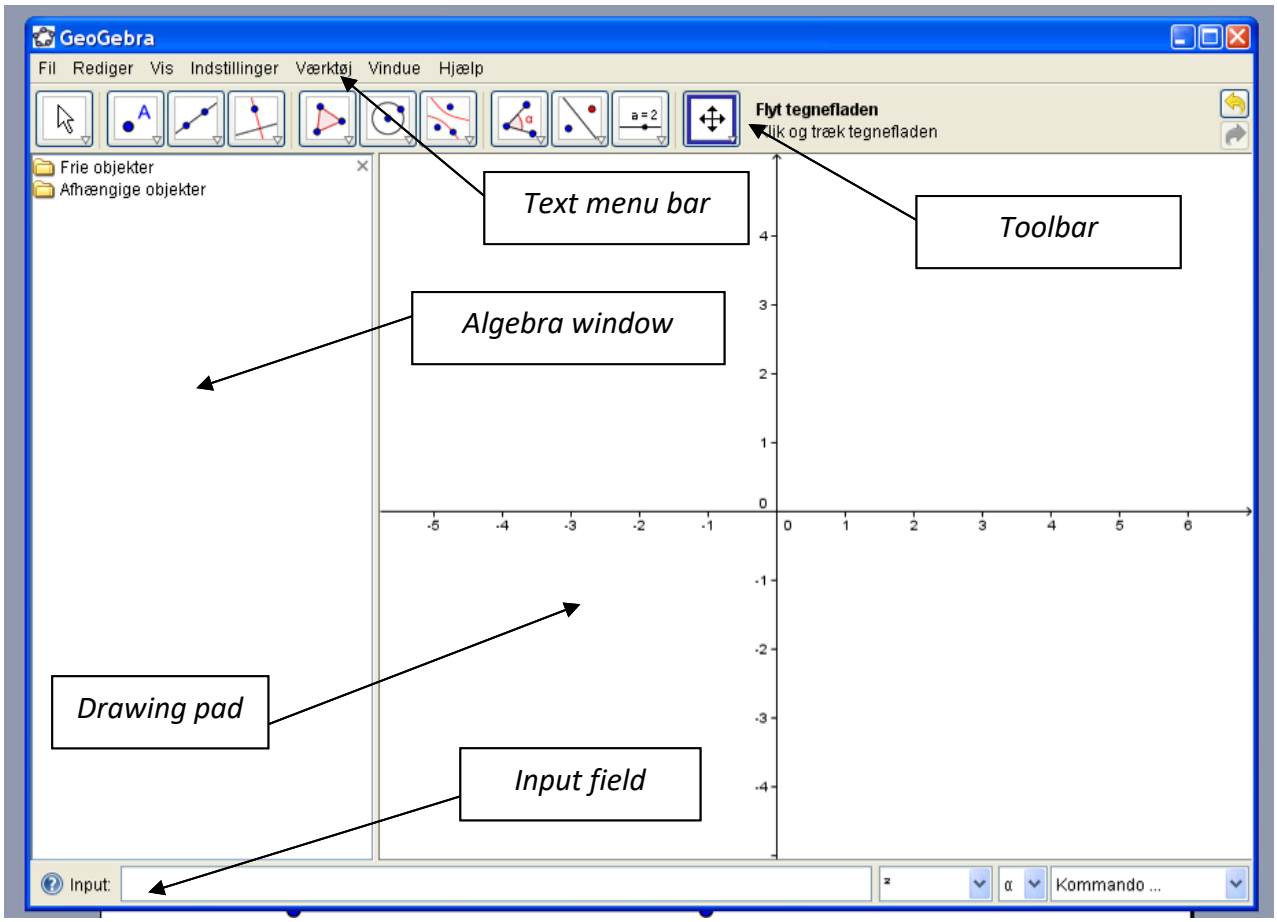
1. General presentation of Geogebra

1.1 Downloading the program

Geogebra can be downloaded for free from the website
https://download.geogebra.org/package/win

1.2 Appearance of home page

When the program starts up, the page looks something like this:



1.3 Overall Features

Below are some of the key features.

1.3.1 Text menu bar

In the text menu, you can make the overall control of the program.

- "File" contains, among other things:
  - "New drawing" which gives a new worksheet while the old worksheet is still open in another window.
  - "New" which deletes everything in the current worksheet.
  - "Open..." which opens a previous sheet that is stored on your computer, for example.
  - "Save" which saves the same location where the file was saved last time.
  - "Save as..." which saves the file in a specified location.
  - "Export" which can be used when a drawing needs to be moved to another program.
  - "Print Preview" which can show how a printout will look.
  - "Close" which can shut down the program.

Note: When printing from Geogebra, the easiest way to do this is via "Print Preview"

- "Edit" contains, among other things:
  - "Undo" which makes you regret the last action. You can undo several actions by using the function several times. Note that you can also use the key shortcut "ctrl+z".
  - "Repeat" which you can use if you still do not want to regret an action. Note that you can also use the key shortcut "ctrl+y".
  - "Delete" which deletes what is selected. Often, however, it will be easier to use the "Delete" key after you have marked what you want to delete.
  - "Select All" which marks everything that you have done on the drawing pad.
  - "Copy the drawing" which copies what is selected. Subsequently, the drawing can then be inserted into another program (e.g. a spreadsheet). The key shortcut is "shift+ctrl+c".
    It is not always that the aspect ratio is the same after it has been moved. It can often be a good idea to print drawings from Geogebra and attach them as appendices if you want to be sure that the scale is correct.
    If you insert into MathCad, you must choose "Insert special..." → "Bitmap".

- "Show" includes, among other things:
  - The ability to hide/show: CAS, spreadsheet, algebra window, input field, toolbar, etc. Here you can also make layouts on the drawing pad. For example, the placement of input fields and turning on the help text.

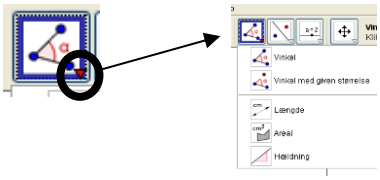
- "Window" contains the ability to switch between different windows that you have open. You can also not open a new window by selecting "New drawing"

- "Help" contains various options for getting help.

1.3.2 The Toolbar

This is where many of the functions that are used when working with mathematics are located. Note that on the right side of the toolbar there is a text that guides you in relation to using the function.

Also note that clicking on the arrow in the bottom right corner of the tool will reveal a menu that provides more options.



1. Tools menu

"Move" This tool is used to mark the objects that you want to do something about. If you hover the cursor (arrow) over the object you want to select. Will the object become more "bold". If you want to select the object, press the left mouse button. If you want to move an object, you can do so by holding down the left mouse button when selecting the object and then moving the cursor. Note that points that are set in (0.0) cannot be moved.

2. Tools menu

"New Point" This tool is used to make a new point. Put the cursor where there should be a point and press the left mouse button.

"Intersection of Two Objects" This tool finds the intersection of two objects. Use the left mouse key to select the two objects.

"Point on Object" This tool is used to "lock" a point to an object. For example, you can lock a point to a line, so that the point can be moved on the line, but not outside the line.

"Connect/Release Point" This tool can lock or release a point from/to a shape.

"Center Point or Center" This tool finds the center between two points.

3. Tools menu

"Line Break Between Two Points" This utility is used to plot a line break between two points. By unfolding the menu, you can also choose other options to set aside a line segment. For example, if the line is to continue after the two set points or if you want to make a horizontal line with a specified length from a specified point. You also have the option of making a vector.

4. Tools menu

"Perpendicular Line" This tool is used to make a perpendicular line to an existing line. By unfolding the menu, you can also select e.g. "Parallel line", "Middle normal" and "Angle halving line".

5. Tools menu

"Polygon" This tool is used to make polygons, which translated into ordinary English are "polygons". These are shapes, such as triangles, squares, etc. "Regular polygon" makes polygons that are regular, from a side length and a number of edges that you specify. "Rigid polygon" makes a polygon that holds its shape, but can be rotated and moved using the two points shown in the figure.

6. Tools Menu

"Circle from center and point" This tool is used to make circles from two points that you set aside. By unfolding the menu, circles can also be made in other ways. For example, by making a circle from the center and a specified radius.

7. Tools menu

"Ellipse" When you unfold this menu, it is possible to create e.g. ellipses, hyperbolas and parabolas. However, it is not a tool that you use very much in the beginning.

8. Tools menu

"Angle" This tool is used to measure an angle. Note that if you choose the three points or the two lines in a clockwise direction, you will get the inside angle. If you choose the points or lines in order counterclockwise, you will get the outside angle. By unfolding this menu, you also have the option of specifying an angle based on a degree. Note that there is a difference between whether the angle should be clockwise or counterclockwise. When you want to make an angle, you first have to left click on the end point at the opposite end of the line, in relation to where you want to make an angle. Then you have to left-click on the endpoint where the angle should be and then a dialog box will automatically appear, where you can write the number of degrees and choose

whether the angle should be clockwise or counterclockwise. You can also measure: the length of a line, the area of a figure or the slope of a line when you unfold this menu.

9. Tools menu

"Mirror object in line" In this menu, it is possible to mirror, rotate and parallel offset objects.

10. Tools Menu

"Insert Text" This tool can be used to insert a text. Another option in the menu is to insert an image.

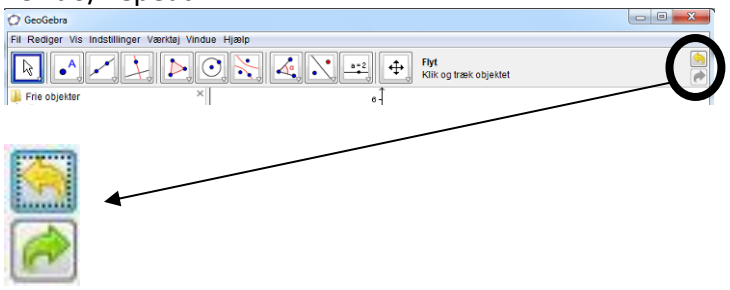
11. Tools Menu

"Slider" In this menu, you have the opportunity to insert different buttons, which can be useful if, for example, you need to make a finished application that the students can work with.

12. Tools Menu

"Move the drawing pad" This tool can move the entire drawing pad, along with the objects drawn on the surface. By unfolding this menu, you can also choose to zoom in or out. Note that even if you have not selected the tool, you can move the drawing pad by holding down "Shift" while holding down the left mouse button and moving the cursor.

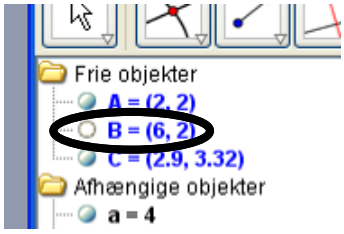
13. Tools Menu
"Undo/Repeat"



On the far right there are two arrows. The yellow arrow pointing to the left can be used to undo an action. The green arrow pointing to the right can be used to restore an action that you have regretted.

1.3.3 Algebra window

In this window you will find information about the objects that you have made on the drawing pad. For example, regulations for functions. In the algebra window, you can also choose whether objects should be visible on the drawing pad. By default, all objects are visible. If you want to make an object invisible, e.g. the point B in a triangle, you do so by clicking on the blue circle to the left of the point in the algebra window. Below you can see that points A and C are visible in the triangle, while point B is not. Note that the "function" of the point does not disappear. It's just not visible. If you want to completely delete a point, it can be done by marking the point and pressing "Delete".



1.3.4 Input field

The input field allows you to enter what you want to do on the drawing pad. For example, you can enter a point or a function here. An example of entering a point could be "(3,4)" and an example of a function could be "f(x)=4x+2".

Note that when you enter the input field, you must use a period instead of a comma in connection with decimal numbers. But you still need to use commas in connection with coordinates. So the item (3.5, 7.3) should be entered like this "(3.5,7.3). In addition, it should be noted that when you want to raise a number to a power, you do it by using the character "^" (Circumflex). So the function f(x)=3x2+7.5 should be entered like this: "f(x)=3x^2+7.5". Alternatively, you can use the "Alt button" to make a power if working on a Windows computer. Then you have to press "f(x)=3x *Alt key* 2 + 7.5". If you are using a Mac, you have to press the "Ctrl button". So you type "f(x)=3x *Ctrl button* 2 + 7.5".

1.3.5 The drawing pad

The drawing pad is the window itself where you can see the objects that you have made. Note that you can, among other things, hide, hide the name, rename or completely delete an object by clicking the right mouse button while the cursor is on the object.

2. Construction

2.1. Construction of figures

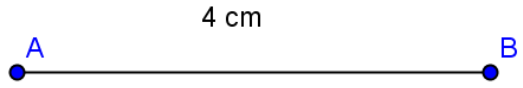
Below are some sketches of some different figures. Note that you are not allowed to measure on sketches.

a.

Paste the points (2,3) and (4,6) into the coordinate system on the drawing pad.
Hint: Use the "New Point" tool or enter the coordinates in the input field.
See instructions: http://www.youtube.com/watch?v=O56oA_vUe0k&feature=plcp

b.

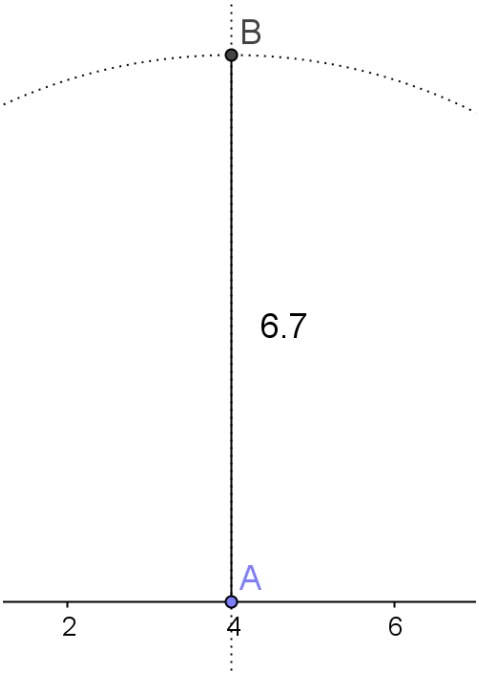
Draw a line of 4 cm.



Hint: Use the "Line Break Between Two Points" or "Line Break of Given Length" tool.
See instructions: http://www.youtube.com/watch?v=x4EwGfalpuM&feature=plcp

c.

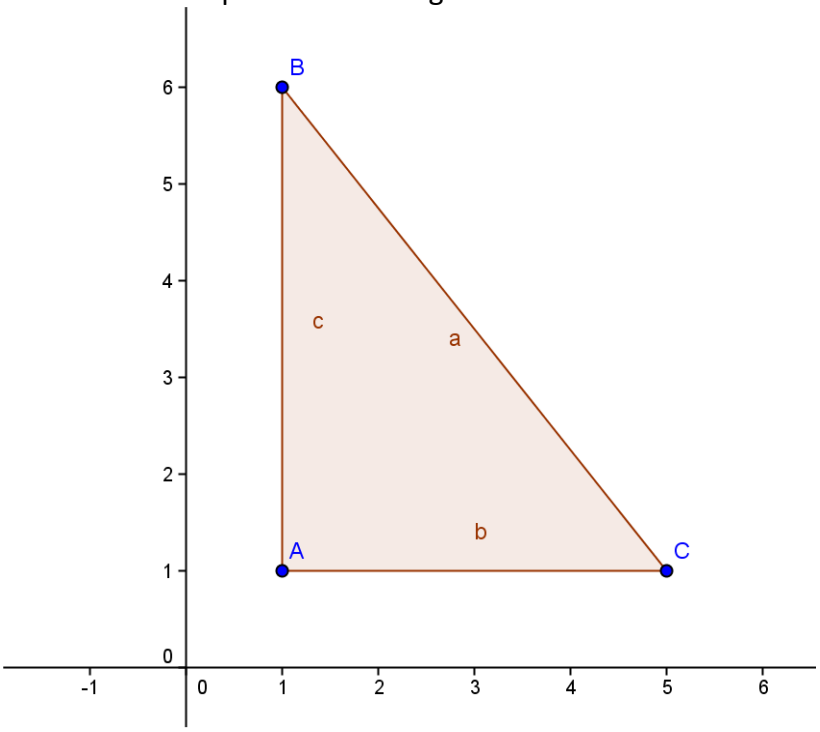
Draw a vertical line of 6.7 cm



Hint: Make a perpendicular line on the x-axis - make a circle with radius. Mark intersections and make a line between the 2 intersections

d.

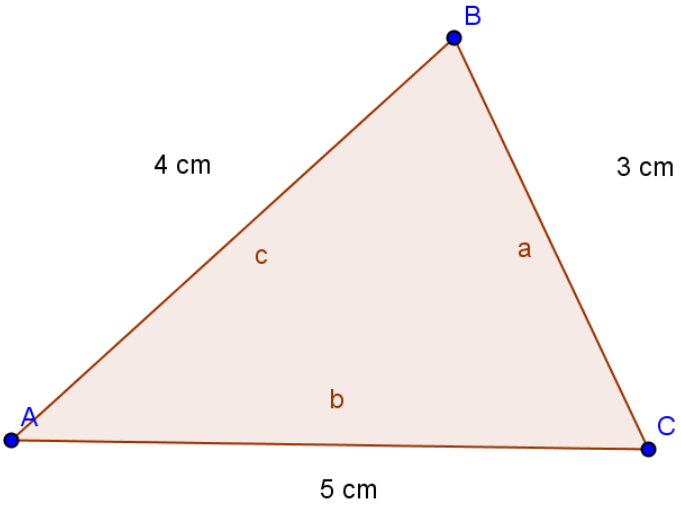
Paste the points A (1.1), B (1.6) and C (5.1) into the coordinate system on the drawing pad and connect the points to a triangle.



Hint: Use the "Polygon" tool (A good habit is to plot the points in the polygon counterclockwise around)
See instructions: http://www.youtube.com/watch?v=-kGXB_LXJnI&feature=plcp

e.

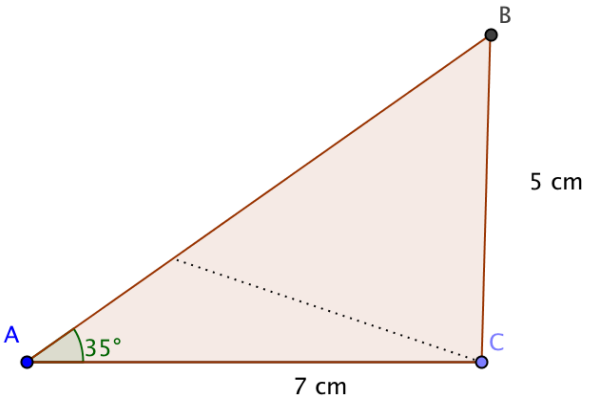
Draw the following triangle.



Hint: Use the "Circle from Center and Radius" tool to set aside the pages.
See instructions: http://www.youtube.com/watch?v=dwA2ZuIqTh8&feature=plcp

f.

Draw the following triangle.



Note that there are two possible solutions
Hint: Use the "Angle of Given Size", "Line Through Two Points" and "Intersection of Two Objects" tools. In addition, you can hide the redundant points in the algebra window.
See instructions: http://www.youtube.com/watch?v=qrwW98Rbf4M&feature=plcp

g.

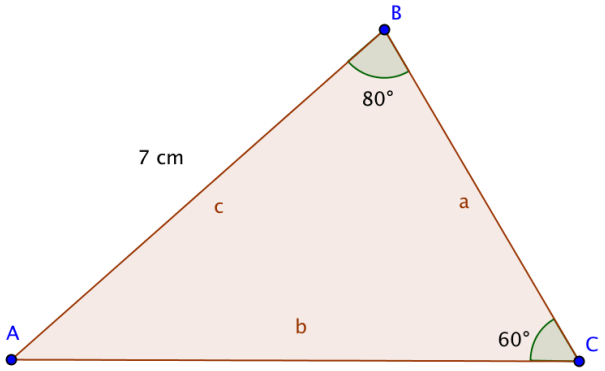
Use the triangle in the previous task as a starting point and find:

- Page length on page c
- Area of the triangle
- Size of angle B

Hint: Use the "Angle", "Length" and "Area" tools
See instructions: http://www.youtube.com/watch?v=q_G7u2zcTQc&feature=plcp

h.

Draw the following triangle.
See instructions: http://www.youtube.com/watch?v=wb3_6DicGic



i.

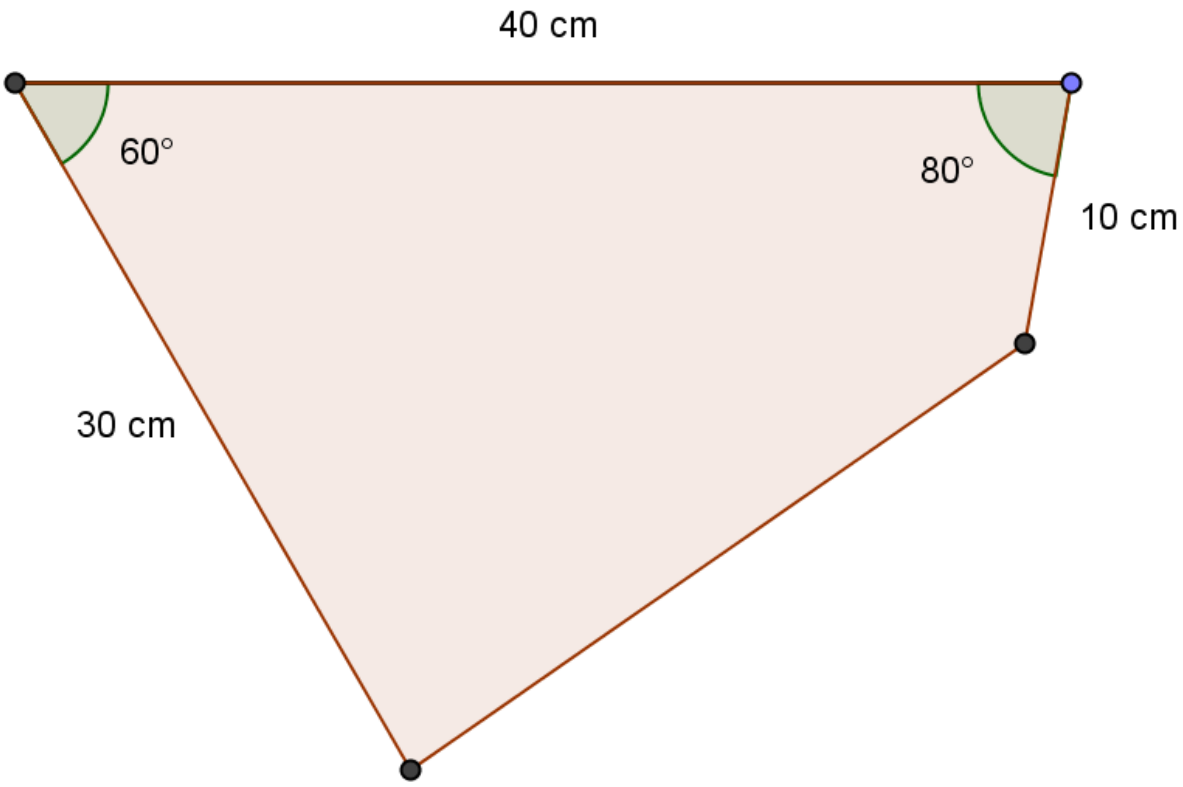
The triangle from the previous task should be named so that the angle and page letters match the outline of the previous task (if you haven't done so in the first place☺).
Hint: Use the "Insert Text" tool or rename using the right mouse button.
See instructions: http://www.youtube.com/watch?v=wb3_6DicGic

j.

Below is a sketch of a figure.

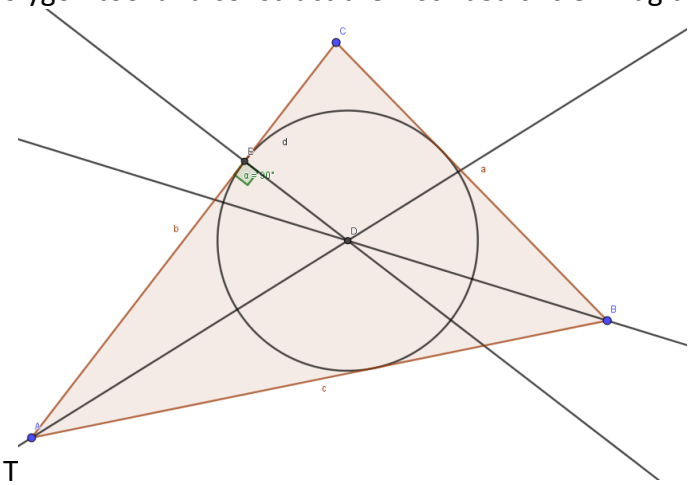
- Draw the shape at a scale of 1:2.
- Read the length of the last page of the drawing.
- Calculate the length of the last page in reality.

See instructions: http://www.youtube.com/watch?v=Bm0fcuBTmJA&feature=plcp



k. Triangle with the inscribed circle

Draw a triangle with the polygon tool and construct the inscribed circle. Drag the blue dots



and check if it looks right. T

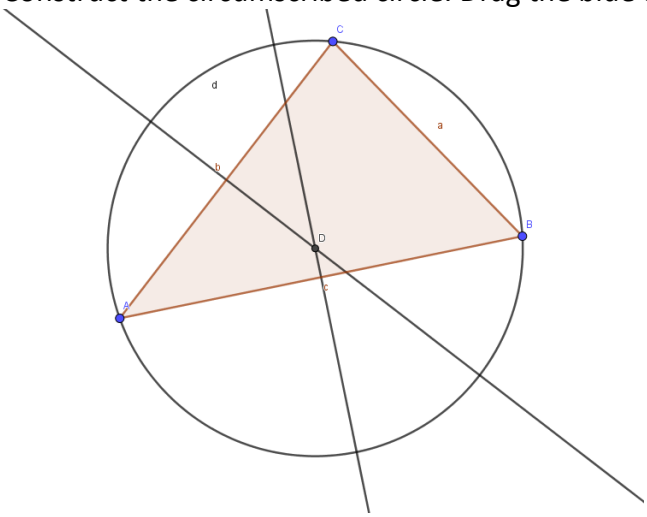
Hint: Use the "Angular Halving Lines" and "Perpendicular Line" tools.

See instructions: http://www.youtube.com/watch?v=ju9_nyzHoRM&feature=plcp

l.

Draw a new triangle with random side measurements with the polygon tool

Construct the circumscribed circle. Drag the blue dots and check if it looks right.



Hint: Use the "Middle Normals" tool

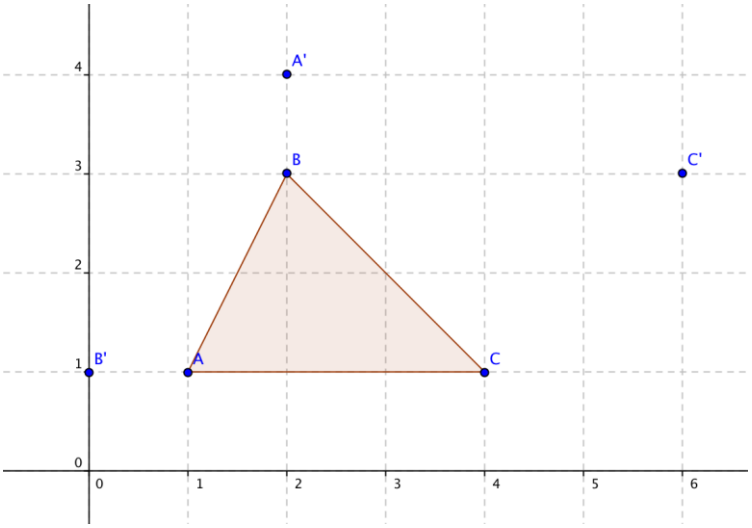
See instructions: http://www.youtube.com/watch?v=yEpKfV27TN4&feature=plcp

m.

The triangle with a rewritten circle that you created in the previous task should be copied and moved into a typing tool (e.g. spreadsheet or word).

See instructions: http://www.youtube.com/watch?v=hBR4yolcmbA&feature=plcp

2.2 Mirroring, turning and parallel shift



a.
Draw the figure ABC and set out points A', B' and C' as in the drawing above.
See instructions: http://www.youtube.com/watch?v=VSO6ea4a6Vs&feature=plcp

b.
Mirror the figure ABC in the y-axis.
See instructions: http://www.youtube.com/watch?v=VSO6ea4a6Vs&feature=plcp

c.
Mirror the figure ABC at point A'.
See instructions: http://www.youtube.com/watch?v=VSO6ea4a6Vs&feature=plcp

d.
Turn the shape ABC 90 degrees clockwise around point B'.
See instructions: http://www.youtube.com/watch?v=VSO6ea4a6Vs&feature=plcp

e.
Parallel shift the figure ABC so that point C shifts to point C'.
See instructions: http://www.youtube.com/watch?v=VSO6ea4a6Vs&feature=plcp

3. Features

3.1 Exercises in functions

a.

Draw function:
f(x)=3x+5
Hint: Use the "Input field".
See instructions: http://www.youtube.com/watch?v=G4lfn6ww7dQ&feature=plcp

b.

Characters in a new coordinate system function:
f(x)=3.5x+2
Hint: Remember to use a period instead of a comma.
See instructions: http://www.youtube.com/watch?v=G4lfn6ww7dQ&feature=plcp

c.

Draw in a new coordinate system the functions:
f(x)=2x-6 and g(x)=-2x+6
Find the intersection between the two functions.
Hint: Use "Intersecting Two Objects."
See instructions: http://www.youtube.com/watch?v=G4lfn6ww7dQ&feature=plcp

d.

Characters in a new coordinate system function:
$f(x)= 2x4-7x^3+4x^2+3x-2$
Find all the intersections that the function has with the two axes in the coordinate system.
Hint: Use "^" (Circumflex)[1] to put a number up in a power.
See instructions: https://www.youtube.com/watch?v=M42uOxAHMOI&feature=youtu.be

e.

Draw in a new coordinate system the functions:
$f(x)=3.45x+7$ and $g(x)= 4x^2+3x-2$
Find the intersection between the two functions.
Show how to read the x and y value for the intersection between the two functions.
Hint: Use "Perpendicular line"
See instructions: http://www.youtube.com/watch?v=dfBw78pWO2E&feature=plcp

f.

In a new coordinate system, draw the growth functions:
$f(x)=100(1 + 0.05)^x$ and $g(x)=50(1 + 0.1)^x$
Find the intersection between the two functions.
Hint: Use "^" (Circumflex)
See instructions: http://www.youtube.com/watch?v=vYoM-CWcCaw&feature=plcp

[1] Optionally, you can use "everything" to increase potency. On a Mac computer, you can use "ctrl". However, it gives some problems later. For example, if you have to put x in power in "f(x)=3x"

g.

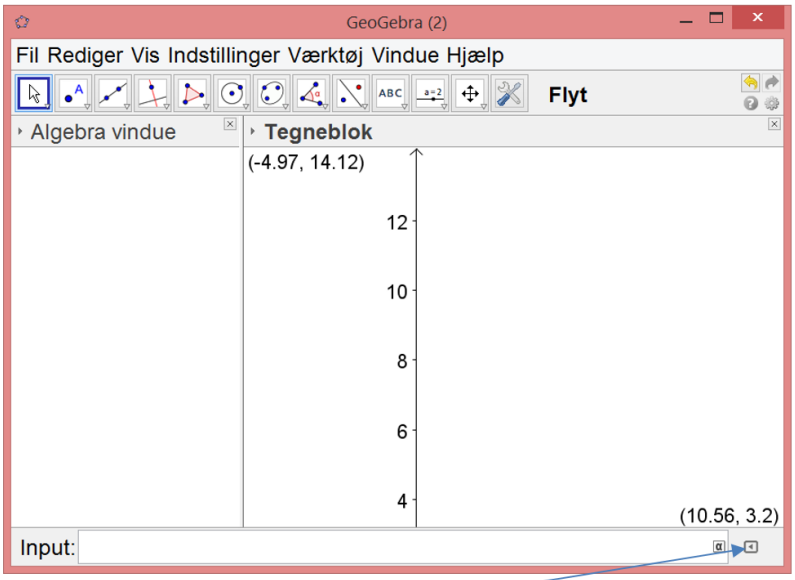
Characters in a new coordinate system function:
f(x)=24/x
Show on the function which y-value is associated with the x-value 6.
What value does x have when f(x) is 48?
Hints:
Type in input line "x=6"
Type in input line "y=48"
Find the intersection

3.2 Helper commands for functions

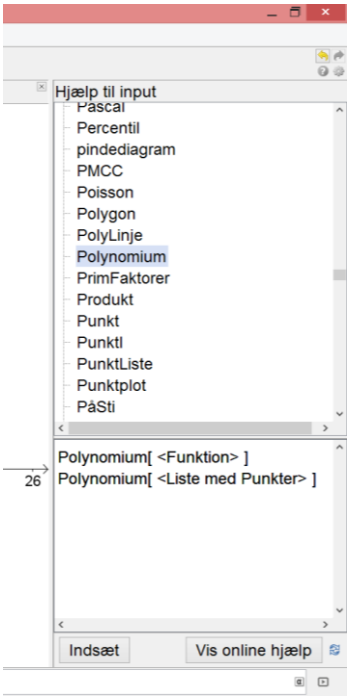
In addition to the graphical user interface, which we have worked with the most in the previous one, you also have the option to use different commands.

There are two options for inserting a command:

- In the bottom right corner, you can select "Help with input", which then unfolds a menu.
- You can type the command in the input field. When you initiate a command, Geogebra makes suggestions as you type.



Tryk på pil for at udfolde kommandomenu



Find the desired command in the top right window "Input Help"

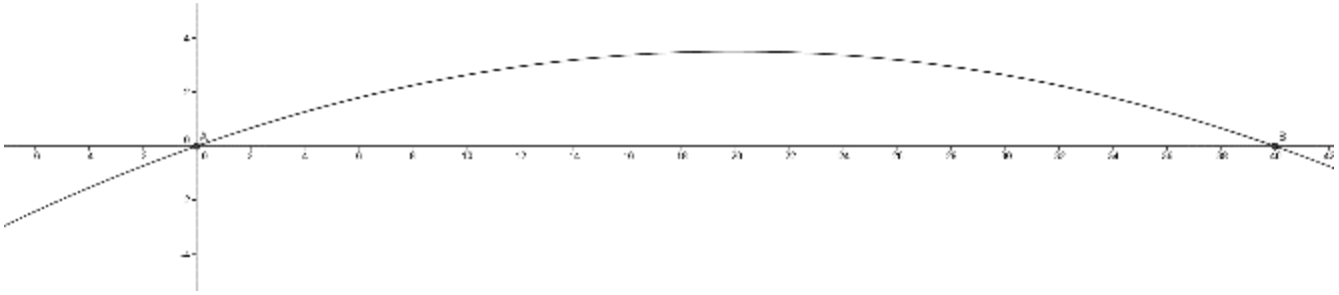
In the lower right window, select which sub-command you want to select.

Press "Insert" to move it to the input bar.

3.2.a Refining a function

Type in the input line: f(x)=-0.00878 x² + 0.3511 x, 0<x<40

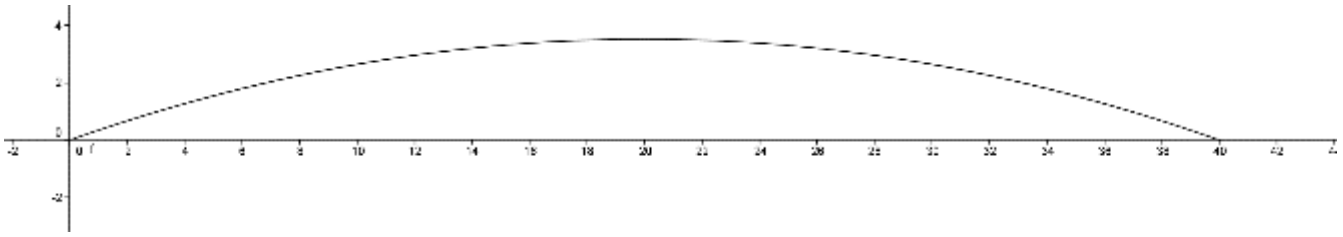
This command is used if you want to delimit a function. When you draw the function, you will be able to see that the graph goes below the x-axis when the x-value is less than 0 or above 40.



In some tasks, it may be required to be able to limit the function to only apply when x is from 0 to 40. So x belongs to the interval [0; 40]

f(x)=ax+b, starting value<x<ending value

Initial value in the command is the lower limit, end value is the upper limit. So in relation to our example with the ball, you could write **f(x)=-0.00878 x² + 0.3511 x, 0<x<40**



If you only want the positive side of a function, you can write e.g. **f(x)=2x+2,x>0**

3.2.b Extremum[f] and Rod[f]

The extremum[f] finds one or more vertices in relation to the function "f". In the square bracket, write the letter of the function where you want to find the vertex(s). For example, "extremum[f]" finds the vertice(s) for the function "f", while extremum[g] finds for the function "g", and so on. In the algebra window, you can then read the coordinate to the vertex(s). For example, if the function is called $f(x)=2x^{2+x-1}$, then you first write the precept in Geogebra. Then you write "extremum[f]"

Root[f] finds one or more zeros relative to the function "f". The zero points are also called the roots and are where the function intersects the x-axis. In the square bracket, write the letter of the function where you want to find the zero point(s). In the algebra window, you can then read the coordinate to zero point(s). For example, if the function is called f(x)=2x2+x-1, then you first write the formula in Geogebra. Then you write "root[f]"

3.2.c Polynomial[A,B,C]

Polynomial[A,B,C] makes a graph (also called a polynomial) that goes through points A, B and C, which you have previously inserted into the coordinate system. In the algebra window, you can then read the formula for this graph. If you want to change the course of the graph, you can drag the points from which you have formed the graph.

3.2.d Cutting[f,g]

With intersection[f,g] you can find the intersection between functions "f" and "g". In the algebra window, you can then read the coordinate to the intersection. Of course, you can also find the intersection by using the "Intersection between two objects" tool, which you can find in the toolbar. This is described earlier in the compendium.

3.2.e Incline[f]

With slope[f], one can find the slope of the function or line f. In the algebra window, you can then read the slope afterwards. Of course, you can also find the intersection by using the "Tilt" tool, which you can find in the toolbar. This is described earlier in the compendium.

3.3 Here you can read more about different commands

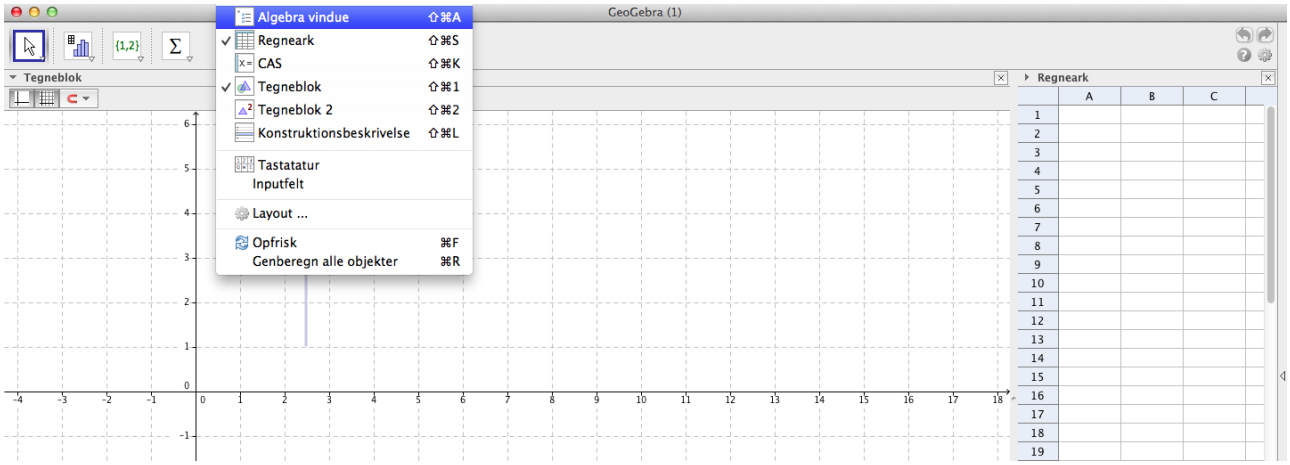
Tips for Geogebra:
https://www.matematikbanken.dk/id/434/Tips%20til%20geogebra/

Geogebra help page in English

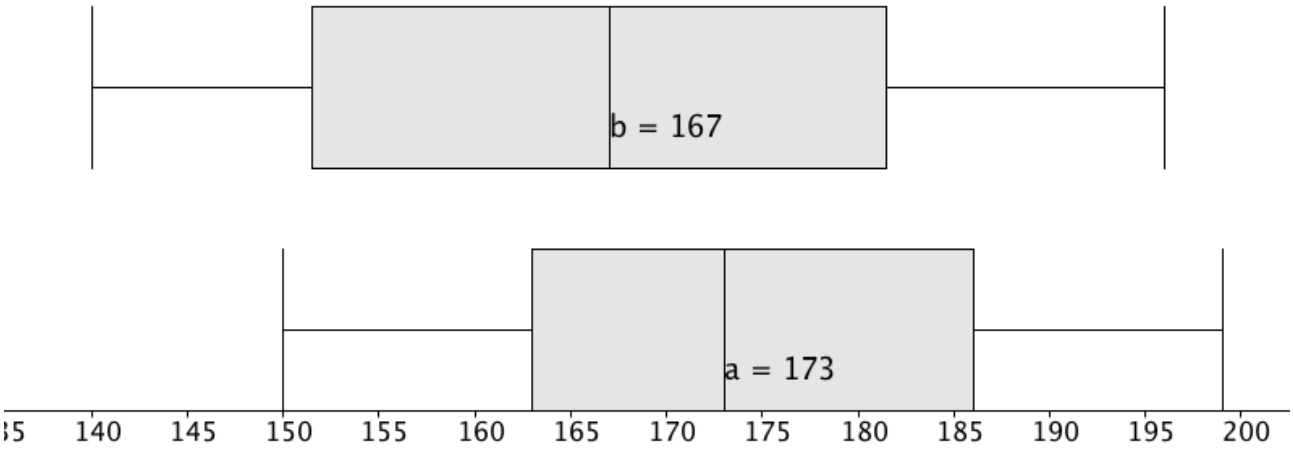
- https://wiki.geogebra.org/en/Main_Page
- On https://wiki.geogebra.org/en/Category:Commands you can find descriptions of many different commands

4. Statistics

4.1 Box plot based on raw data

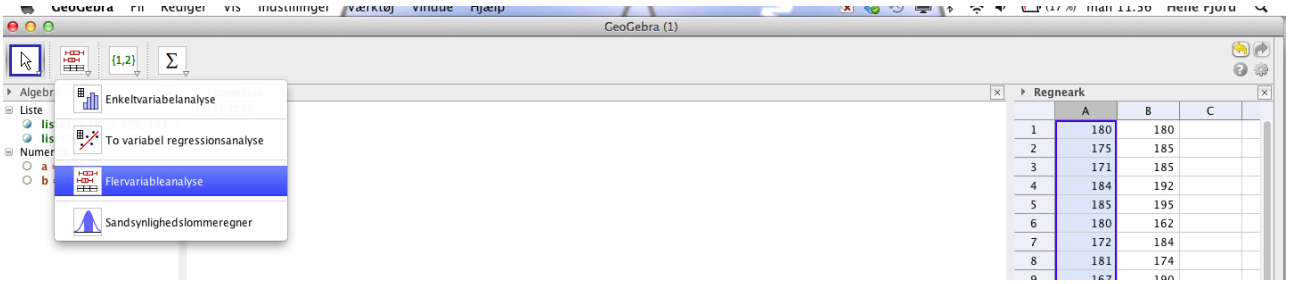


- Go to "View" – tap "Spreadsheet"
- Drag the bar to the spreadsheet so you can see both column a and column b
- Find data in the sheet "Have students become smaller" – Mark all numbers in column A2:A57
    - Data can be downloaded from http://matematikbanken.dk/L/39/ (Box Plot Data)
- Go to Geogebra – stand in A1 right click and press paste
- Now in Geogebra, press the column heading A. (then the entire column will be highlighted)
- Now right-click the selection and select "make list"
- In the algebra window, L1={190,152,197,162 appears....
- Now type in the input bar: Box plot[1,0.5,list1]
- The command for box plot is Box Plot[where on the y-axis should the center of the box plot be, how wide should the box plot be, Which list should I use]
- You can't see that anything has happened in Geogebra – but that's because the box plot is further out of the x-axis. Tap and drag the drawing surface to see the box plot.
- Shrink the drawing surface (right-click on the drawing surface and select zoom, 50%, may be done several times)
- Subsequently, the same is done with the numbers from the C column. Remember that the command for the box plot should be: Box plot[4,0.5, list2]
- If you want to compare the height of the boys from 2014-15, you need to make sum baskets first. See more under 4.3

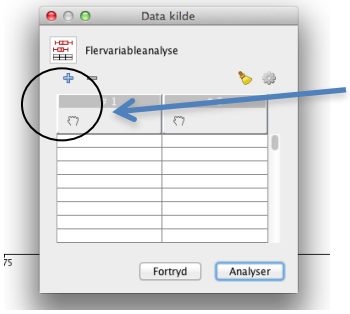


When comparing two box plots, it can be an advantage to do a multivariable analysis.

- Here you start by inserting the observations into the spreadsheet "column A and column B"
- One of the columns is highlighted so that the toolbar appears.

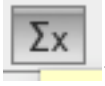


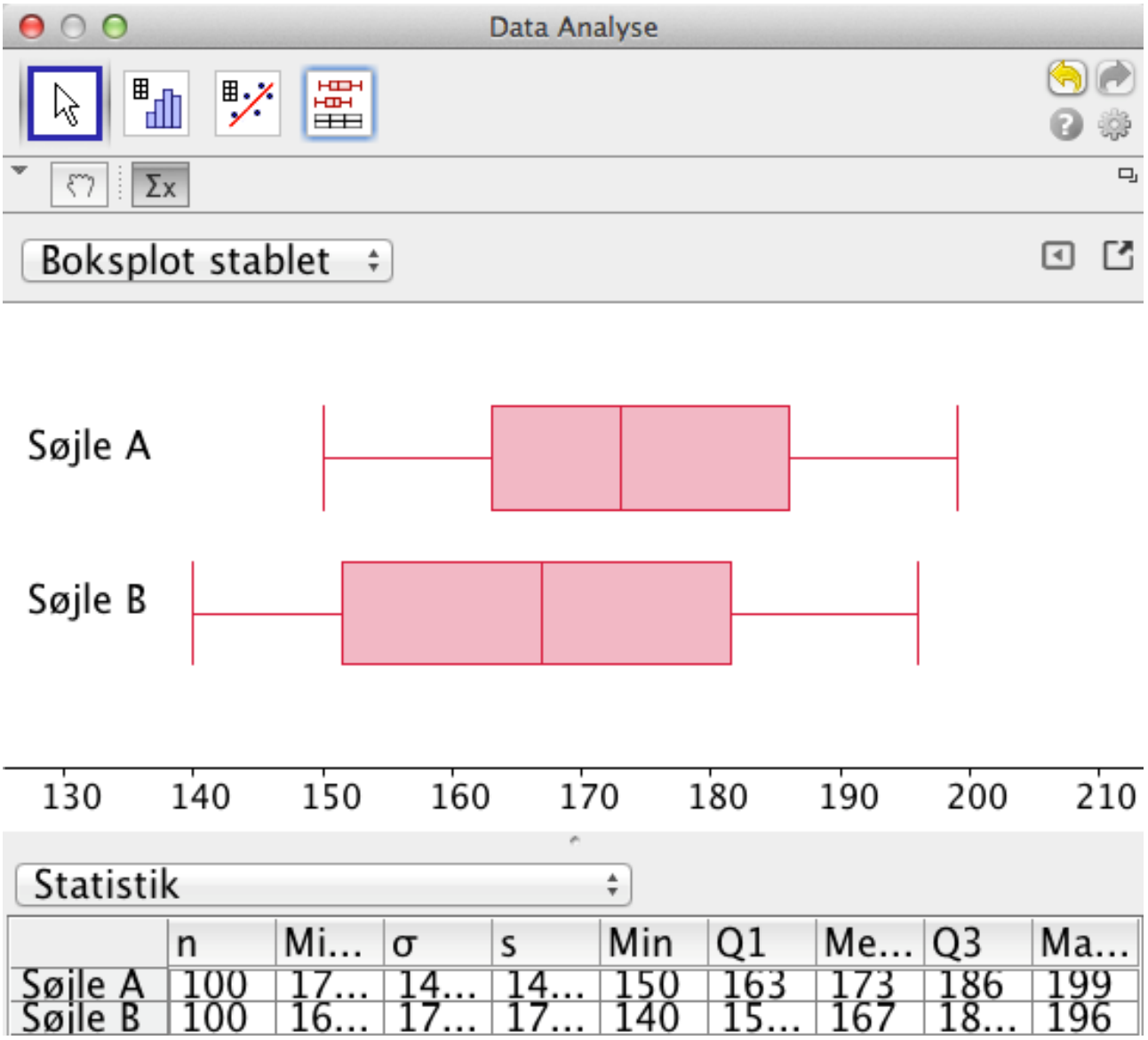
- You have to choose multivariable analysis.



Press the hand so that the desired column's data is copied in. Repeat with both columns.

Then press analyze and Geogebra will produce the desired box plots.

Tap  to view observation set data



	n	Mi...	σ	s	Min	Q1	Me...	Q3	Ma...
Søjle A	100	17...	14...	14...	150	163	173	186	199
Søjle B	100	16...	17...	17...	140	15...	167	18...	196

- Here you will also be able to read the minimum value, the maximum value, the quartiles, the mean value and the median.

4.2 Box plot manually

Box plot for single observations based on observation diagram.
The observation chart can form the basis for a box plot, as it allows you to read the values you need (lower quartile, median and upper quartile)

Observation	h(x)	H(x)	f(x)	F(x)	
6	4	4	10	10	
7	2	6	5	15	
8	4	10	10	25	nedre kvartil
9	2	12	5	30	
10	4	16	10	40	
11	2	18	5	45	
12	4	22	10	55	Median
13	0	22	0	55	
14	2	24	5	60	
15	2	26	5	65	
16	6	32	15	80	Øvre kvartil
17	8	40	20	100	
	40				

The following table appears and the quartile additions can be read.

- 8 contains from 15-25%, therefore the lower quartile
- 12 contains from 45-55%, therefore it is the median
- 16 contains from 65-80%, therefore the upper quartile

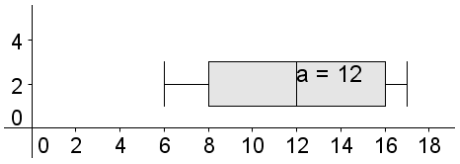
We now have the information needed to create a box plot.
Type "box" in the input field and select the below, and the rest of the line below will appear, and then just fill in with the right numbers

Input: **Boksplot[<yOffset>, <yScalering>, <Start Værdi>, <Q1>, <Median>, <Q3>, <Slut værdi>]**

The command is structured so that you first have to type "box plot[]" to indicate that you want to make a box plot. Next, you need to specify the values for the box plot. These values must be separated by a comma and inserted in between the square brackets.

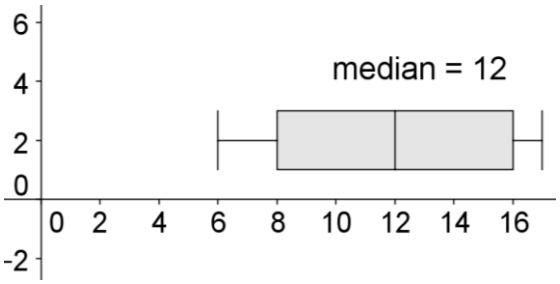
- First, you need to specify where you want the box plot to be located. For example, if you type "2", then the box plot is around a horizontal line that lies next to 2 on the y-axis. But of course, you decide where it should be placed. "yOffset"
- Next, the height of the box plot must be indicated. For example, if you write "1", it means that the box plot fills one unit above and one unit below a horizontal line. "yScaling"
- Subsequently, the minimum value, the 1st quartile, the median, the 3rd quartile and the largest value are written. All these values are separated by a comma and after the largest value, the command ends with "]"
- Minimum value (starting value)→6
- 1st quartile (Q1)→8
- Median→12
- 3rd quartile (Q3)→16
- Maximum Value (Final Value) →17

So the command becomes:
"Box Plot[2,1,6,8,12,16,17]"



In the middle of the box plot, it will say "a=12". This can be changed by right-clicking on the a and selecting "Rename".

For example, you could write "median". Thus, in the box plot, it will say "median=36"



4.3 Box plot by grouped observations from sum curves

Manufacture of sump baskets:

Trace the points in Geogebra.

First point is the first interval starting point,0 HERE (0,0)

The next point is the first interval endpoint, F(x) next to the interval HERE (5,9.52)

The next point is the next interval endpoint, F(x) next to the interval HERE (10,23.81)

All points are marked

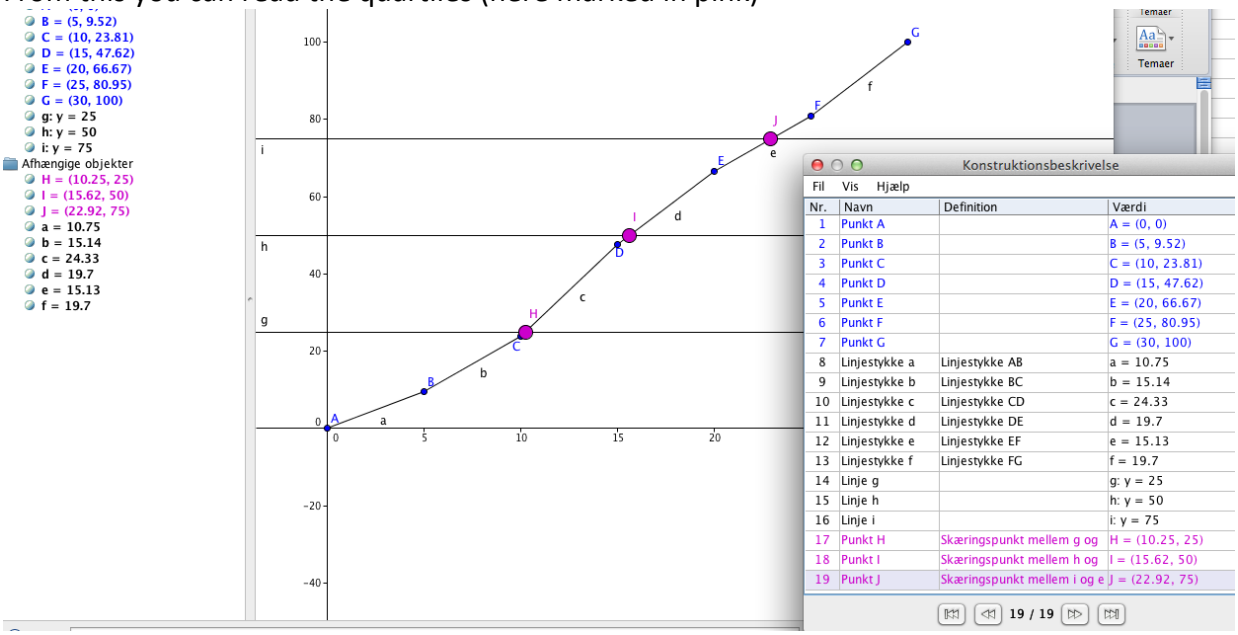
	h(x)	H(x)	f(x)	F(x)
0;5	2	2	9,52%	9,52%
5;10	3	5	14,29%	23,81%
10;15	5	10	23,81%	47,62%
15;20	4	14	19,05%	66,67%
20;25	3	17	14,29%	80,95%
25;30	4	21	19,05%	100,00%
	21			

Next, the points are connected by line segments.

Draw y=25 and y=50 and y=75 in the coordinate system

Mark the intersections with the graphs

From this you can read the quartiles (here marked in pink)



We now have the information needed to create a box plot.

yOffset – use 50

yScale – use 50

Starting value (minimum value) – here 0

First quartile (lower quartile) – here 10.25

Median – here 15.62

Third quartile (upper quartile) – here 22.92

Final value (largest value) – here 30

5. Using Geogebra for Assignments (Functions)

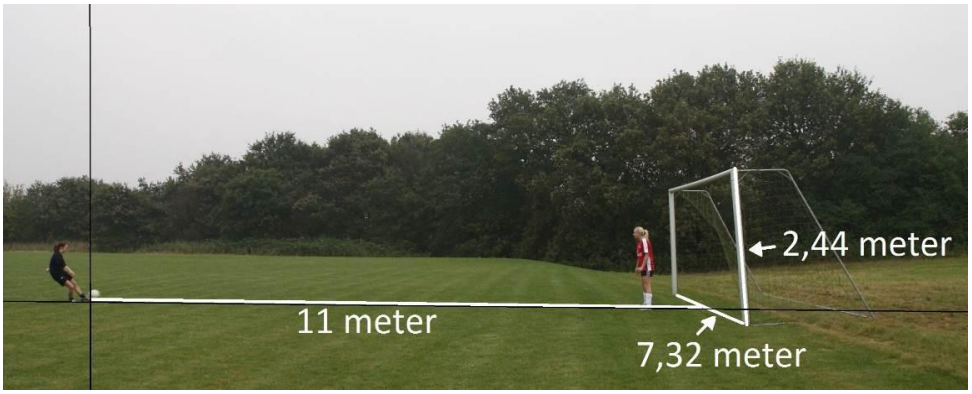
The following tasks must be solved by using Geogebra together with an enrollment tool. (e.g. spreadsheet or Wordmat)

5. The soccer kick

Two girls are at soccer practice. Nanna Lundhus is on goal and Marie Poulsen kicks on goal from the penalty spot. From the penalty spot and into the goal line there are 11 meters.

A soccer goal has the following size:

- Width 7.32 meters and height 2.44 meters



The trajectory of the ball in connection with the kick has approximately the shape of a parabola with the functional regulation:

$f(x)=-0.00878\ x^2 + 0.3511\ x$

- where x is the distance from the penalty spot in meters (horizontal).
- where f(x) is the height of the ball in metres above the ground after x number of metres

(Remember to specify what the axes show. Here it could be "Meters from the penalty spot" out of the x-axis and "Meters above the ground" up the y-axis)

5.1 In Geogebra, draw a graph that describes the trajectory of the ball.

5.2 Read and mark on the graph where the ball has the greatest height if it is not stopped along the way.

5.3 Read and mark on the graph how far the ball will fly before it hits the ground for the first time, if it is not stopped along the way.

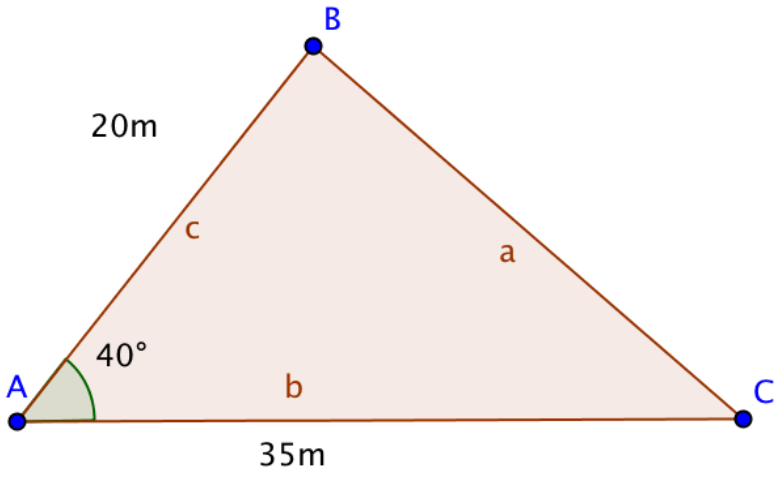
5.4 Read and mark on the graph what height the ball has after the first 11 meters into the goal, and assess whether the ball goes into the goal.

6. Using Geogebra in connection with assignments (Geometry)

6. The garden

The students in the School have been allowed to decorate a piece of the school's land into a small garden.

A sketch of the garden looks like this:



6.1 Make a drawing of the garden on a scale of 1:250.

6.2 Read angles B and C.

6.3 Read the length of page a on the drawing.

6.4 Calculate the length of page a in reality.

6.5 Read the area of the garden in the drawing.

6.6 Calculate the area of the garden in reality.

In the garden, the students want to have a flagpole. It should be placed so that there is an equal distance to all three sides of the garden.

6.7 Draw the flagpole into the drawing.

In addition to a flagpole, the students also want a birdbath that has the shape of a circle with a radius of 1.25 meters. The birdbath must be placed so that the center is equidistant from angles A and C, and 3.75 meters from side b.

6.8 Draw the birdbath into the drawing.