

Workshop: Dynamic Geometry with ClassPad and ClassPad Manager

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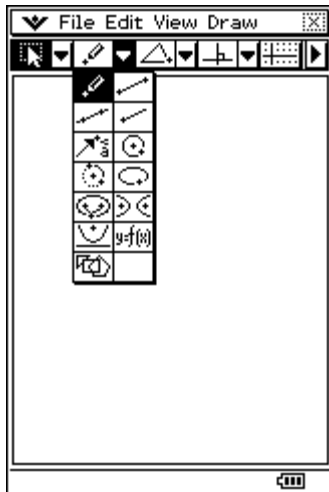
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Abstract

There are several dynamic geometry programs available. Even if they differ somewhat from each other they are based on the same ideas. In this workshop we will work with the dynamic geometry software supplied with ClassPad 300 from CASIO. This program has many of the standard properties of dynamic geometry programs, but also includes some very special properties. We will look into this module and experiment with the different possibilities. The following is a presentation of the different elements in the workshop:

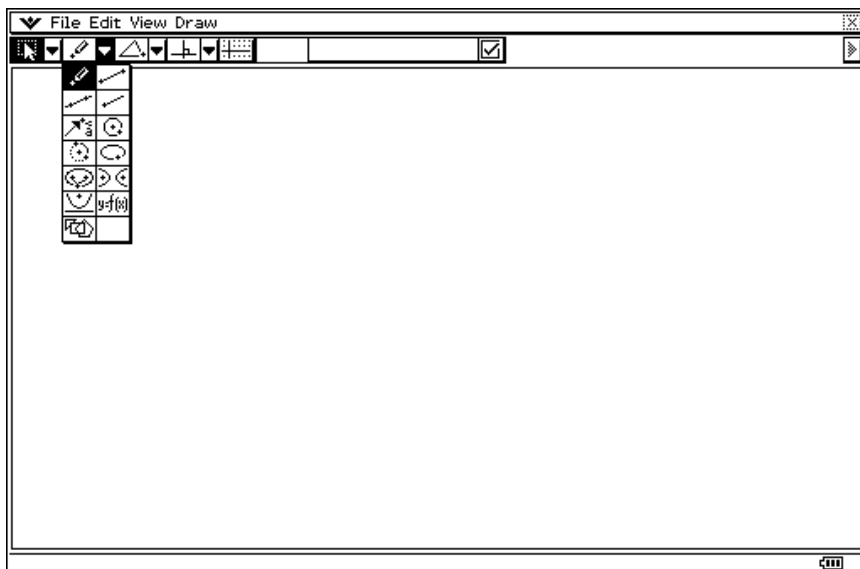
Introduction: On overview of ClassPad 300 and ClassPad Manager software.

The calculator and the software will be presented:



To the left is the calculator screen in Geometry:
Fixed size mode, with menu-buttons on top, and one
menu-button expanded

Below is the calculator screen in Geometry:
Resizable mode, with menu-buttons on top, and one
menu-button expanded



We will briefly also demonstrate input possibilities, pen (mouse) and keyboards.

Constructing basic shapes

Polygons, circles etc.

Construction techniques.

Task: To construct an inscribed and circumscribed circle to a triangle.

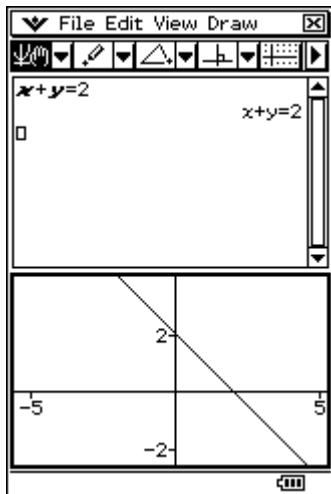
Measurement and coordinate system

There are also dimensions on the screen, we can mark and measure geometrical objects. There is also a coordinate system which will be visible by toggle on/off.

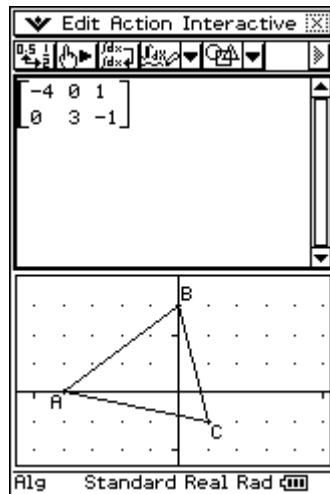
Task: To see that the sum of the angles in a triangle is equal to 180° .

Split screen (dual windows)

Starting with the *Main* screen, we can combine this with other screens, such as geometry. Elements such as equations or geometrical shapes can be dragged from one screen (environment) to another.



The equation $x + y = 2$ is shown both as an equation and also as a graph in the lower (*Geometry*) window.



Triangles represented as matrices can also be dragged.

Task: Draw the circle: $x^2 + y^2 = 9$ in the *Geometry* window.

Construction with constraints

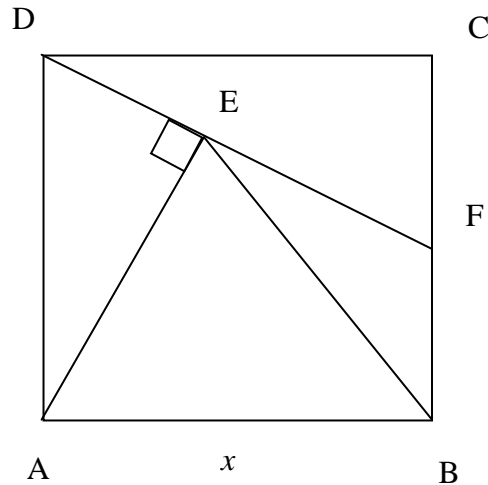
Working with ClassPad we can set lengths and angles to certain values. This is a very nice feature when solving classical geometry problems.

Problem solving in classical geometry

We will work on some classical problems:

Tasks:

- (1) The measure of the sides of a square ABCD is x . F is the midpoint of BC, and $AE \perp DF$. Find BE. (Choose a fixed value for x and make a guess)



- (2) A circle is inscribed in quadrant of a circle of radius 8.
What is the measure of the radius of the inscribed circle?
- (3) **Viviani's theorem:**
The sum of the distances to the three sides of an equilateral triangle from a point lying inside or on a side is constant and equal to the height of the triangle.

Geometry on a geoboard

On the ClassPad screen the coordinate system are marked by points. Using this mode points marked on the screen will snap to the coordinate points. This gives us the possibility to use the ClassPad screen as a geoboard.

Task: **Pick's formula**

Pick's formula relates the area of a figure drawn on a geoboard (integer grid) with the number of interior points and points on the boundary.
Investigate the relationship.