Tools reference sheet to be used with GeoGebra Activities

- **Point tools**
  - Point - Click on the drawing pad in the Graphics View in order to create a new point. The coordinates of the point are fixed when the mouse button is released.
  - Midpoint or Center - click on either two points or one segment to get its midpoint. You can also click on a conic section (circle or ellipse) in order to create its center point.
  - Intersect - Intersection points of two objects either:
    Selecting two objects creates all intersection points (if possible) or
    Directly clicking on an intersection of the two objects creates only this *single intersection point*.
  - Point on an object - To create a point, which is fixed to an object, activate the tool first and then select the object. This new point can be moved via Move Tool, but only within the object.
    - **Note:** To put a point in the interior of a Circle or Ellipse you will need to increase the Opacity from 0 first. If you click on the perimeter of an object (e.g. Circle, Ellipse, Polygon), then the point will be fixed to the perimeter rather than the interior.
  - Attach/ detach point - To **attach a point** to a path or region click a free point and the path or region. From now on, the point can still be moved via Move Tool, but only within the path or region.
    To **detach a point** that is defined as point on path or region simply select the point. The point will become free.
- **Line tools**
  - Line - Selecting two points *A* and *B* creates a straight line through *A* and *B*
  - Segment - Selecting two points *A* and *B* creates a straight line through *A* and *B*
    - note:In the Algebra View, the segment's length is displayed.
  - Segment with given length - Select the point that should be the starting point of the segment. Specify the desired length of the segment in the appearing window.
    - Note:This tool creates a segment with a specific length and an endpoint which may be rotated around the starting point by using the Move tool
  - Ray - Selecting two points *A* and *B* creates a ray starting at *A* through *B*
  - Vector - Select the starting point and then the end point of the vector
  - Vector from a point - Select a point *A* and a vector *v* to create the new point $B = A + v$ as well as the vector from *A* to *B*.
- **Special line tools**

- Perpendicular line
- parallel line
- perpendicular bisector
- Angle bisector
- Tangents
- polar or diameter line
- best fit line
- Locust

- **Measurement tools**
  - Angle - With this tool you can create angles in different ways:
    - Click on three points to create an angle between these points. The second point selected is the vertex of the angle.
    - Click on two segments to create the angle between them.
    - Click on two lines to create the angle between them.
    - Click on two vectors to create the angle between them.
    - Click on a polygon to create all angles of this polygon.

Notes:

If the polygon was created by selecting its vertices in counter clockwise orientation, the *Angle* tool gives you the interior angles of the polygon

Angles are created in *counter clockwise* orientation. Therefore, the order of selecting

  - angle with given size - Select a leg point, then the angle vertex and type the angle's size into the input box of the appearing window.
  - distance or length - This tool returns the distance between two points, two lines, or a point and a line as a number, and shows a dynamic text in the Graphics View. It can also be used to measure the length of a segment (or interval), the circumference of a circle, or the perimeter of a polygon.
  - Area
  - Slope - By selecting a line, this tool gives you the slope of a line and shows a slope triangle in the Graphics View, whose size may be changed using Properties Dialog
    - For a line defined by points *A* and *B* (in this order) using Line Tool or Line Command, the slope triangle is placed to point *A*. For line *l* defined using input line (entered as equation, e.g. `l:x+2y=3`), the triangle is placed at the y-intercept (point on *l* with zero x-coordinate). If you want to place the triangle elsewhere, you can follow these instructions.
      - **1.** select Line Tool, click the line *l* in two points to create points *C* and *D*; new line will be created at the same time
      - **2** use *Slope Tool* on the newly created line
      - **3** hide point *D*
      - **4** move *C* to adjust position of the slope triangle
  - List

❖ **Circle and arc tools**

- ➢ Circle with center through point
  - ■ Selecting a point *M* and a point *P* defines a circle with center *M* through *P*.
- ➢ Circle with center and radius
  - ■ Select the center point, then enter the radius in the text field of the appearing dialog window.

❖ **Action object tools**

- ➢ https://wiki.geogebra.org/en/Action_Object_Tools
- ➢
  - Button Tool
  - Check Box Tool
  - Input Box Tool
  - Slider Tool
- ➢