EXPLORATIONS™

Appendix B

Cabri® Jr. Tool Guide

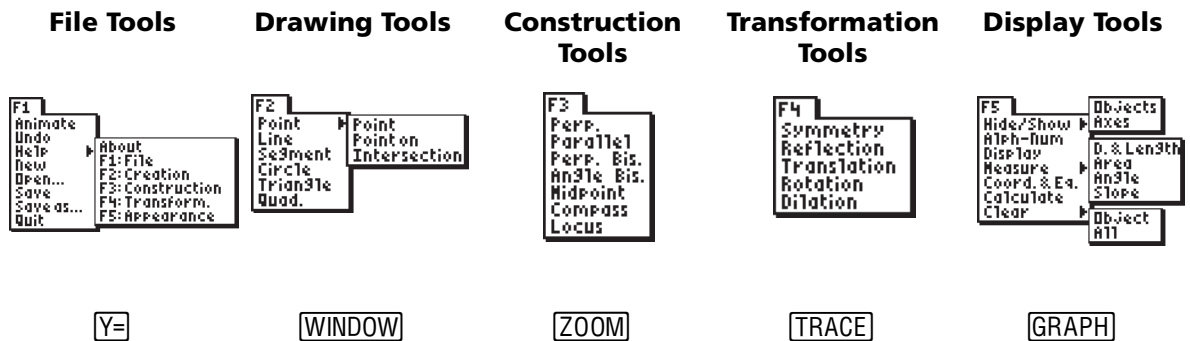| File Tools	Drawing Tools	Construction Tools	Transformation Tools	Display Tools

Y=	WINDOW	ZOOM	TRACE	GRAPH

Navigating within the App

To use the Cabri Jr. App, you select tools and options from a set of menus. The menus remain hidden until you open them.

The menus are labeled **F1** through **F5** and correspond to the graphing keys directly below the screen. Press ALPHA plus the function key (**F1–F5**) to open a menu. For example, to open the **File Tools Menu**, press ALPHA [F1].

Menu Name	Graphing Key	Menu function	Press
F1	Y=	File Tools	ALPHA [F1]
F2	WINDOW	Drawing Tools	ALPHA [F2]
F3	ZOOM	Construction Tools	ALPHA [F3]
F4	TRACE	Transformation Tools	ALPHA [F4]
F5	GRAPH	Display Tools	ALPHA [F5]

- Press ▲ and ▼ to move from one menu item to the next.
- Press ▶ to view a submenu.

- Highlight a menu item and press ENTER to select it.

- Press CLEAR to exit a tool or to close the menu and return to the drawing screen.

- Press ◀, ▲, ▶, or ▼ to move the pointer around on the screen. You can press and hold an arrow key to move the pointer rather than repeatedly pressing it.

File Tools—ALPHA [F1]

Animate allows you to put into motion a point that is on a segment or a circle, causing that point to move along the segment or circle. Other objects logically depending on the point will also be put into motion.

Highlight the point you wish to animate and press ENTER to animate that point. You can have more than one point animated at one time.
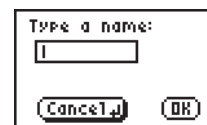
Stop Animate allows you to stop an animation. Select **Animate** then press 2nd to access **Stop Animate**. Press ENTER to stop the animation.

Note: *If you have more than one point animated, you can stop the animation of one point by pressing* ENTER *when the cursor is touching the animated point.*

Undo allows you to undo the last change to your figure. Select **Undo** and press ENTER to undo your change. (If you select **Undo** again, your figure will be changed back.)
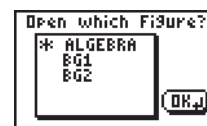
Help allows you to view help text related to a selected menu. Select **Help**, highlight the menu you want to view help text for and press ENTER to view the help text.

New allows you to open a new figure. If the current figure has not been saved, you will be presented with an option to save it before opening the new figure.

Note: *File names can be up to eight characters, can include alpha-numeric characters, and must start with a letter. After entering the first letter, press* 2nd *to turn the number lock on and off.*

Open allows you to open a saved figure. If the current figure has not been saved, you will be presented with an option to save it before opening the new figure.

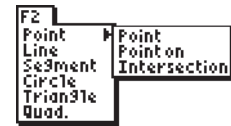| File Icon	Meaning
None	File stored in active memory (RAM) and will be lost after reset
∗	File stored in archive memory and will not be lost after reset
□	Current (open) file, file stored in active memory
⊞	Current (open) file, file stored in archive memory

Save allows you to save the current figure. If the current figure has not been saved, you will be presented with an option to name the figure. To leave this menu without saving, press ◄ to highlight ⟨Cancel⟩ and press ENTER.

Save As allows you to save the current figure using a new name. Enter the new name for the figure and press ENTER to save it. To leave this menu without saving, press ◄ to highlight ⟨Cancel⟩ and press ENTER. The **Save As** file is now the file that is open.

Quit allows you to exit the Cabri® Jr. App.

Drawing Tools—ALPHA [F2]

▫ **Point > Point** allows you to add a point to your figure. Highlight **Point** and press ► to move to the submenu. Highlight **Point** and press ENTER. Move the cursor to the desired location on the screen and press ENTER to add the point.

Point > Point On allows you to add a point to an existing object (e.g., a segment or a circle). Highlight **Point** and press ► to move to the submenu. Highlight **Point On** and press ENTER. Move the cursor to the desired location on the object and press ENTER to add the point to the object.

Point > Intersection allows you to add a point to your figure at the intersection of two objects (e.g., a circle and a line). Highlight **Point** and press ► to move to the submenu. Highlight **Intersection** and press ENTER. Move the cursor to the intersection point and press ENTER or move the cursor to select the first object and press ENTER, then move the cursor to the second object and press ENTER again. All intersection points will be added.

Line allows you to add a line to your figure. Highlight **Line** and press ENTER. Move the cursor to the desired location of the first point and press ENTER. Then move the cursor to the desired location of the second point (you will see a dotted line). Press ENTER to draw the solid line.

Note: *When constructing objects, you can use existing points and/or create new points to define the object.*

Segment allows you to add a line segment to your figure. Highlight **Segment** and press ENTER. Move the cursor to the desired location of the first endpoint and press ENTER. Then move the cursor to the desired location of the second endpoint (a dotted line will be drawn as you move the cursor) and press ENTER. The dotted line segment will become a solid line.

Circle allows you to add a circle to your figure. Highlight **Circle** and press ENTER. Move the cursor to the desired location for the center and press ENTER, then move the cursor to a location that gives the desired radius for your circle (this point will be referred to as the radius point). Press ENTER to add the circle.

⬜ **Triangle** allows you to add a triangle to your figure. Highlight **Triangle** and press ENTER . For each vertex, move the cursor to the desired location and press ENTER . The triangle will be complete after the third vertex is anchored.

⬜ **Quadrilateral** allows you to add a quadrilateral to your figure. Highlight **Quad.** and press ENTER . For each vertex, move the cursor to the desired location and press ENTER . The quadrilateral will be complete after the fourth vertex is anchored.

## *Construction Tools—* ALPHA [F3]

⬜ **Perpendicular** allows you to construct a line that is perpendicular to an existing segment or line at a defined point. Highlight **Perp.** and press ENTER . Move the cursor to highlight the desired segment or line and press ENTER to select it. (The cursor will change to an arrow.) Move the cursor to the point the new line is to pass through and press ENTER to construct the perpendicular line.

Note: You can select the point first and then the segment or line if desired. In general, the order you select objects of different types will not affect the results of using a particular tool.

⬜ **Parallel** allows you to construct a line that is parallel to an existing segment or line at a defined point. Highlight **Parallel** and press ENTER . Move the cursor to highlight the desired segment or line (The cursor will change to an arrow.) and press ENTER to select it. Move the cursor to the point the new line is to pass through and press ENTER to construct the parallel line.

⬜ **Perpendicular Bisector** allows you to construct the perpendicular bisector of a line segment. Highlight **Perp. Bis.** and press ENTER . Move the cursor to highlight the desired segment (The cursor will change to an arrow.) and press ENTER to construct the perpendicular bisector.

Note: Instead of selecting a given segment you can select any two points and they will behave as a segment.

⬜ **Angle Bisector** allows you to construct the line that will bisect an angle. Highlight **Angle Bis.** and press ENTER . Move the cursor to a location on one side of the angle and press ENTER to select it. Move the cursor to the vertex of the angle and press ENTER to select it. Move the cursor to a location that is on the second side of the angle and press ENTER to construct the angle bisector.

⬜ **Midpoint** allows you to construct a point on the segment that is equidistant from the endpoints. Highlight **Midpoint** and press ENTER . Move the cursor to highlight the desired segment (The cursor will change to an arrow.) and press ENTER to construct the midpoint.

Note: Instead of selecting a given segment, you can select any two points and they will behave as a segment.

Compass allows you to draw a circle anywhere on the screen using the selected segment as the radius. Highlight **Compass** and press ENTER. Move the cursor to highlight the desired segment (The cursor will change to an arrow.) and press ENTER to select it. Move the cursor to the desired location and press enter to draw the compass circle.

Note: Instead of selecting a given segment you can select any two points and they will behave as a segment.

Locus allows you to create a locus of an object (e.g., a point or segment) that is logically dependent upon a point that is on a segment or a circle. Highlight **Locus** and press ENTER. Move the cursor to the object for which you want to create a locus (The cursor will change to an arrow.) and press ENTER to select it. Move the cursor to a point on the segment or circle on which the first point is logically dependent and press ENTER to generate the locus.

Transformation Tools—ALPHA [F4]

Symmetry allows you to create an image that is point symmetric to an object (e.g. point, segment, triangle) through a defined point. (Point symmetry is the same as a rotation of 180° about a point.) Highlight **Symmetry** and press ENTER. Move the cursor to highlight the desired object and press ENTER to select it. Move the cursor to the desired point of symmetry and press ENTER to create the image.

Reflection allows you to create an image that is a reflection of a given object across a line or segment of symmetry. Highlight **Reflection** and press ENTER. Move the cursor to highlight the desired object and press ENTER to select it. Move the cursor to highlight the line or segment across which the object is to be reflected and press ENTER to create the image.

Translation allows you to create an image that is a translation of a given object a distance and direction defined by a segment. Highlight **Translation** and press ENTER. Move the cursor to highlight the desired object and press ENTER to select it. Move the cursor to highlight a segment and then press ENTER to create the image.

Note: Instead of selecting a given segment you can select any two points and they will behave as a segment.

Rotation allows you to create an image that is a rotation about a given point by a given angle. Highlight **Rotation** and press ENTER. Move the cursor to highlight a given object and press ENTER to select it. Move the cursor to the center of rotation and press ENTER to select it. Select three points that represent the angle of rotation (pressing ENTER after each) to create the image. The order of selection changes the direction of the rotation.

Note: Use the central angle of a circle as your angle of rotation when animation of the rotation is desired.

Dilation allows you to create an image that is proportional to a given object having a constant of proportionality equal to a given dilation factor. Highlight **Dilation** and press [ENTER]. Move the cursor to highlight a given object and press [ENTER] to select it. Move the cursor to a point that is to be the center of the dilation and press [ENTER] to select it. Move the cursor to highlight the dilation factor (a numeric value on the figure) and then press [ENTER] to create the image.

Display Tools—[ALPHA] [F5]

Hide/Show > Objects allows you to hide objects that are part of your figure or show objects that are hidden. Highlight **Hide/Show** and press [▶] to move to the submenu. Highlight **Objects** and press [ENTER]. Move the cursor to highlight an object you want to hide or show and press [ENTER].
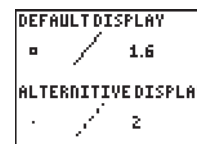
Hide/Show > Axes allows you to hide or show the coordinate axes on your figure. Highlight **Hide/Show** and press [▶] to move to the submenu. Highlight **Axes** and press [ENTER].

Alpha-Numeric allows you to add text to your figure and labels to your points (point labels stay with the point when it is moved). Highlight **Alph-Num** and press [ENTER]. Move the cursor to a desired location on your figure or highlight a point and press [ENTER]. Type the desired characters (up to 22 for text and 6 for a point label) and press [ENTER] to add the text or label.

Note: To add numeric characters and other math symbols (e.g. +, ^, etc.) press [2nd] to activate number lock (¹A). Press [2nd] again to turn off number lock.

Display allows you to change the way a point, line, segment or measurement is displayed. Highlight **Display** and press [ENTER]. Move the cursor to highlight the desired object and press [ENTER] to change the display of the selected object.

Note: You should consider all measurements to be rounded for display purposes.

Measure > Distance & Length allows you to measure the length of a segment, the perimeter of a triangle or quadrilateral, or the circumference of a circle. Highlight **Measure** and press [▶] to move to the submenu. Highlight **D. & Length** and press [ENTER]. Move the cursor to highlight the desired object and press [ENTER] to measure it. Move the measurement to a convenient location on your figure and press [ENTER] to anchor the result.
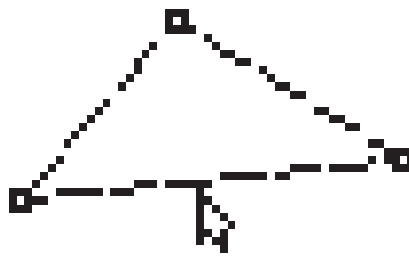
*Note: When a side of a triangle or quadrilateral is highlighted, the display will switch every few seconds from selecting the segment to selecting the entire figure (see below). Since the **Distance & Length** tool can measure both the length of a side and the perimeter of the figure, be sure you highlight the desired feature of the object. You can change the selection by holding the [2nd] key.*

Segment only   *Entire Triangle*

Only one line is animated.   *The entire figure is animated.*

Measure > Area allows you to measure the area of a triangle, a quadrilateral, or a circle. Highlight **Measure** and press ▸ to move to the submenu. Highlight **Area** and press ENTER. Move the cursor to highlight the desired triangle or quadrilateral and press ENTER to measure the area. Move the measurement to a convenient location and press ENTER to anchor the result.

Note: Area of polygons drawn using the segment tool cannot be measured using this tool.

Measure > Angle allows you to measure an angle between 0 and 180 degrees determined by three points. Highlight **Measure** and press ▸ to move to the submenu. Highlight **Angle** and press ENTER. Move the cursor to select a point on one side of the angle and press ENTER to select it. Move the cursor to the vertex of the angle and press ENTER to select it. Move the cursor to a point on the second side of the angle and press ENTER to measure the angle. Move the measurement to a convenient location and press ENTER to anchor the result.

Note: As with naming angles, the order in which you select the points defines the angle you are measuring. Be sure to select the points in the order that is consistent with the angle you are measuring.

Measure > Slope allows you to measure the slope of a line or segment. Highlight **Measure** and press ▸ to move to the submenu. Highlight **Slope** and press ENTER. Move the cursor to highlight the desired line or segment and press ENTER to measure the slope. Move the measurement to a convenient location and press ENTER to anchor the result.

Note: The slope of a vertical line will display as ###.

Coordinates & Equation allows you to displays the coordinates of a point or the equations of lines and circles to your figure. Highlight **Coord. & Eq.** and press ⌷ENTER⌷. Move the cursor to highlight a point, line, or circle and press ⌷ENTER⌷ to display the coordinates or equation. Move the coordinates or equation to a convenient location and press ⌷ENTER⌷ to anchor the result.

Calculate allows you to perform mathematical operations using measurements and numeric values on your figure. Highlight **Calculate** and press ⌷ENTER⌷. Move the cursor to highlight the first numeric value and press ⌷ENTER⌷ to select it. Move the cursor to highlight the second value (this is not necessary for finding the square root) and press ⌷ENTER⌷ to select it. Select the desired operation by pressing ⊞ (⬚), ⊟ (⬚), ⊠ (⬚), ⊡ (⬚), or ⌷√⌷ (⬚) to complete the calculation. Move the results of the calculation to a convenient location and press ⌷ENTER⌷ to anchor the result.
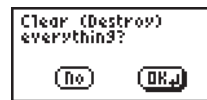
Note: You can perform operations on only two numeric values at a time. To perform operations on three or more values (e.g. the sum of the three angles of a triangle), perform a new calculation making use of the results of a previous calculation.

Note: Only values greater than ⁻204.8 and less than 204.7 will be displayed. Other values will be displayed as ###.

Clear > Object allows you to remove objects from your figure. Highlight **Clear** and press ⌷▶⌷ to move to the submenu. Highlight **Object** and press ⌷ENTER⌷. Move the cursor to highlight the desired object and press ⌷ENTER⌷ to clear the object.

Clear > All allows you to clear all objects from your figure. Highlight **Clear** and press ⌷▶⌷ to move to the submenu. Highlight **All** and press ⌷ENTER⌷. This will clear the screen. You can use **Undo** to get your figure back.

Note: Pressing ⌷CLEAR⌷ three times followed by ⌷ENTER⌷ will also clear all objects from the figure. You can exit this screen without clearing everything by pressing ⌷CLEAR⌷ again.

Graphing Handheld Keys used with Cabri® Jr.

Key	Description
Y=	Accesses the **File** tools (**F1**)
WINDOW	Accesses the **Draw** tools (**F2**)
ZOOM	Accesses the **Construction** tools (**F3**)
TRACE	Accesses the **Transformation** tools (**F4**)
GRAPH	Accesses the **Display** tools (**F5**)
^	Toggles between menu choices
CLEAR	Deletes selected objects and all objects logically related
ALPHA	Grabs a selected object or toggles Number Lock on or off
CLEAR	Exits a selected tool or clears a message from the screen
x^2	Selects square root option of the **Calculate** tool
ENTER	Selects a menu option, selects an object, or anchors a point
◄ ▲ ► ▼	Moves the cursor around the screen or changes menu selection

Cabri® Jr. Cursors

The pointer is the default cursor when no tool is selected. You can deselect any tool by pressing CLEAR.

The hollow pointer appears when you are on or near a object that can be dragged. The highlighted object will flash.

The hand cursor appears when you have grabbed an object. When an object is highlighted, press ALPHA to grab it. Press ALPHA CLEAR or ENTER to release the object.

The pencil is the default cursor for the **Drawing**, **Construction**, and **Transformation** tools, and the **Display** tools when a point can be selected. Additionally, the pencil appears when the **Hide/Show** tool is selected and you are on or near an object that is hidden.

The hollow pencil appears when you are on or near a point that can be selected as part of a tool's operation.

The eraser appears when the **Hide/Show** tool is selected and you are on or near an object that is showing.

The arrow is the default cursor for the **Animate**, **Hide/Show**, and **Clear** tools and the **Display** tools that require objects other than points to be selected. Additionally, the arrow indicates you are on or near an object other than a point that can be selected as part of a tool's operation.

The hollow arrow appears when the **Display** tool is selected and you are on or near an object that will change to default display.

The dotted hollow arrow appears when the **Display** tool is selected and you are on or near an object that will change to alternate display.

The clear cursor appears when the **Clear** tool is selected you are on or near any object. Press ENTER to clear the object and all objects logically dependent upon that object.

The animate cursor appears when the **Animate** or **Locus** tools are selected and you are on or near a point that is drawn on a segment or a circle. Press ENTER to start the animation or create the locus.

The label cursor is the default cursor for the **Alpha Numeric** tool.

The modified label cursor appears when the **Alpha Numeric** tool is selected and you are on or near a drawn point or an existing label.