



LibreOffice
The Document Foundation

Draw Guide

Chapter 3

Working with Objects and Object Points

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Note for Mac users

Some keystrokes and menu items are different on a Mac from those used in Windows and Linux. The table below gives some common substitutions for the instructions in this chapter. For a more detailed list, see the application Help.

Windows or Linux	Mac equivalent	Effect
Tools > Options menu selection	LibreOffice > Preferences	Access setup options
<i>Right-click</i>	<i>Control+click</i> and/or <i>right-click</i> depending on computer setup	Opens a context menu
<i>Ctrl (Control)</i>	⌘ (Command)	Used with other keys
<i>F5</i>	<i>Shift+⌘+F5</i>	Opens the Navigator
<i>F11</i>	<i>⌘+T</i>	Opens the Styles and Formatting window

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Introduction

This chapter looks at the tools and functions that let you modify existing drawings. All of the functions apply to a selected object or a group of selected objects, which can be distinguished by selection handles on a rectangular frame that is large enough to contain the object. Where several objects are selected, the frame around the objects corresponds to the smallest rectangle that can contain all of the objects. This frame is called the selection rectangle.

Note

The color and shape of the selection handles will change depending on the tool and function that has been selected to change the object properties. The color of the selection handles also depends on the computer operating system and how the computer has been set up.


Selecting objects

Direct selection

The easiest way to select an object is to click directly on it. For objects that are not filled, click on the object outline to select it. One click selects; a second click deselects. To select or deselect more than one object, hold the shift button down while clicking.

Selection by framing

You can also select several objects at once by dragging the mouse cursor around the objects. This draws a rectangle around the objects, and only objects that lie entirely within the rectangle will be selected.

To select multiple objects by framing, the Select icon  on the Drawing toolbar must be active.

Note

When you drag the mouse cursor to select multiple objects, the selection rectangle being drawn is also known as a marquee.

Selecting hidden objects

Even if objects are located behind others and not visible, they can still be selected. Hold down the *Alt* key and click on the object behind which the hidden object is located, then click again to select the hidden object. If there are several hidden objects, keep holding down the *Alt* key and clicking until you reach the object you want. To cycle through the objects in reverse order, hold down the *Alt+Shift* keys and click.

When you click on the selected object, its outline will appear briefly through the objects covering it.


Note

Using the *Alt* key method works on computers using a Windows or Mac operating systems. On a computer using a Linux operating system the *Tab* key method, described below, has to be used.

To select an object that is covered by another object using the keyboard, use the *Tab* key to cycle through the objects, stopping at the object you want to select. To cycle through the objects in reverse order, press *Shift+Tab*. This is a very quick way to reach an object, but it may not be practical if there a large number of objects in a drawing.

Arranging objects

In a complex drawing, several objects may be stacked on top of one another. To rearrange the stacking order by moving an object forward or backward, select an object, click **Modify > Arrange** on the main menu bar and select **Bring Forward** or **Send Backward**. Alternatively, right-click the object, select **Arrange** from the context menu, then **Bring Forward** or **Send Backward**.

The Arrange options are also available by clicking on the small triangle or arrow to the right of the Arrange icon  on the Drawing toolbar. This opens the Position toolbar, giving access to the various arrangement options.

Positioning and adjusting objects

Using zoom

To help in the positioning and adjustment of objects, Draw has a zoom function that reduces or enlarges the screen display of the current drawing. For example, zoom in to place objects onto your drawing with greater position; zoom out to see the complete drawing. You can control zooming three ways: using the status bar, the Zoom dialog, or the Zoom toolbar.

Note

Zooming is handled differently on Unix, Linux, and Windows operating systems. A document saved with a 100% zoom factor in Windows is displayed at a larger zoom factor in Unix/Linux.

Status bar

The zoom controls are located on the right side of the status bar (Figure 1); these controls give you quick and easy access to zooming.



Figure 1: Status bar zooming

- Click on the minus sign to reduce the zoom factor.
- Click on the plus sign to increase the zoom factor.
- Click and hold on the slide control and move it to increase or decrease the zoom factor.
- Right-click on the zoom percentage number and select a zoom factor from the context menu that opens.

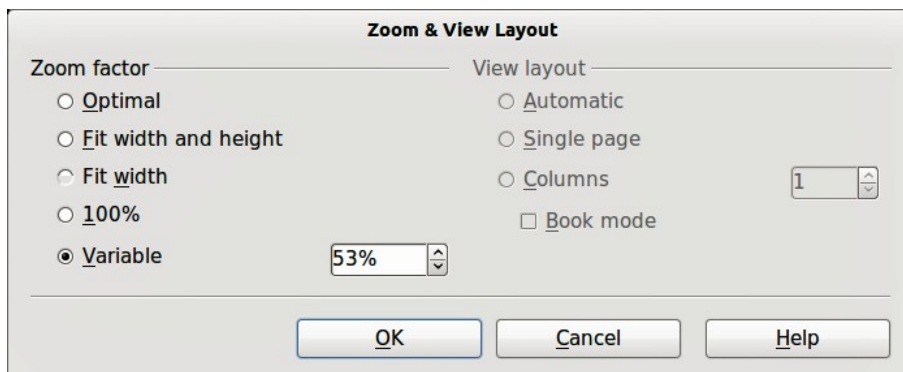


Figure 2: Zoom & View Layout dialog

- Double-click on the zoom percentage number and select a zoom factor from the **Zoom & View Layout** dialog (Figure 2) that opens.

Zoom layout dialog

Go to **View > Zoom** on the main menu bar to open the **Zoom & View Layout** dialog (Figure 2), where you can increase or reduce the zoom factor. The current zoom percentage is displayed on the status bar (Figure 1).

Zoom factor

Sets the zoom factor at which to display the current document and all documents of the same type that you open thereafter.

- *Optimal* – resizes the display to fit the width of the text in the document.
- *Fit width and height* – displays the entire page on your screen.
- *Fit width* – displays the complete width of the document page. The top and bottom edges of the page may not be visible.
- *100%* – displays the document at its actual size.
- *Variable* – enter the zoom factor at which you want to display the document. Enter a percentage in the box.

Zoom toolbar

Go to **View > Toolbars > Zoom** to open the **Zoom** toolbar (Figure 3). The tools available on this toolbar are shown in Figure 4.

- **Zoom In** – displays the slide at two times its current size. Click once on the tool, then move the cursor onto the object and click again. You can also select the **Zoom In** tool and drag a rectangular frame around the area you want to enlarge.
- **Zoom Out** – displays the drawing at half its current size each time the tool is clicked.
- **Zoom 100%** – displays the drawing at its actual size.
- **Zoom Previous** – returns the display of the drawing to the previous zoom factor you applied. You can also use the keyboard shortcut *Ctrl +, (Comma)*.
- **Zoom Next** – undoes the action of the **Previous Zoom** command. You can also use the keyboard shortcut *Ctrl +. (Period)*.
- **Zoom Page** – displays the whole drawing on your screen.
- **Zoom Page Width** – displays the complete width of the drawing. The top and bottom edges of the slide may not be visible.
- **Optimal** – resizes the display to include all of the objects on the slide.
- **Object Zoom** – resizes the display to fit the object(s) you selected.
- **Shift** – moves the drawing within the Draw workspace. Place the cursor on the drawing and drag to move the drawing. When you release the cursor, the last tool you used is automatically selected.



Figure 3: Zoom toolbar

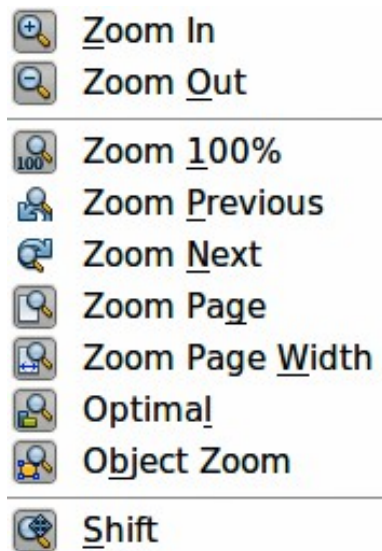


Figure 4: Zoom tools

Moving and adjusting object size

When moving an object or changing its size, check the left-hand area of the status bar at the bottom of the Draw window (Figure 5). The area on the left of the Drawing toolbar, from left to right, shows what object is selected, its position on the drawing in X/Y coordinates and dimensions of the object. The units of measurement are those selected in **Tools > Options > LibreOffice Draw > General**.

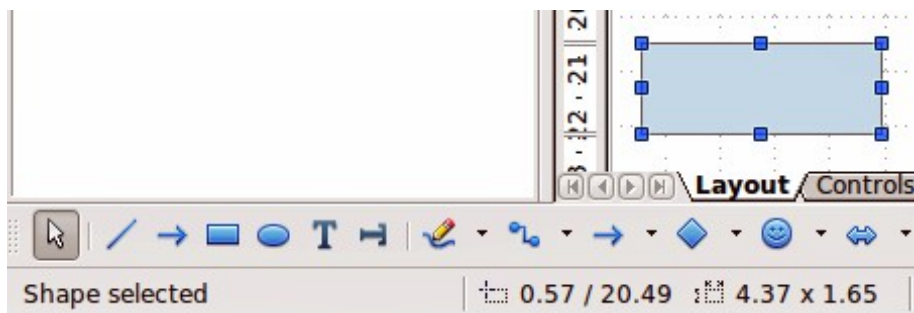


Figure 5: Left end of status bar when moving or adjusting an object

Moving objects

To move an object (or a group of objects), select it and then click within the object borders and hold down the left mouse button while dragging the mouse. During movement, the shape of the object appears as dotted lines to help with repositioning (Figure 6). To locate the object at its new location, release the mouse button.

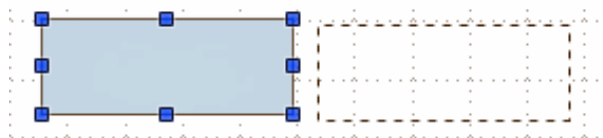


Figure 6: Moving an object

Adjusting object size

To change the size of a selected object (or a group of selected objects), move the mouse cursor to one of the selection handles. The mouse cursor will change shape to indicate the direction of movement for that selection handle. As you change the size of the object, a ghosted outline of the object appears (Figure 7). When you have reached the desired size of the object, release the mouse button.

The results depend on which selection handle you use. To resize an object along one axis, use a side handle. To resize along both axes, use a corner handle.

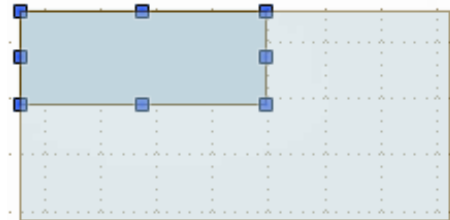


Figure 7: Adjusting object size


Note

If you press the *Shift* key while resizing an object, the change in size will be carried out symmetrically with respect to the two axes so that the aspect ratio of the object remains the same. This *Shift* key behavior works on all selection handles.

This is the default behavior of the *Shift* key. However, if *When creating or moving objects* has been selected in **Tools > Options > LibreOffice Draw > Grid**, the action of the *Shift* key is reversed: that is the aspect ratio will be preserved *unless* the *Shift* key is pressed.

Modifying an arc

The size of an arc can be changed by adjusting position of the start and end points of an arc.

Select an arc and click on the **Points** icon  on the Drawing toolbar. Two larger handles appear at the start and end of the arc (Figure 8). When the mouse cursor hovers over one of these larger handles, the cursor changes shape, allowing you to adjust the position of either the start or end points of the arc.

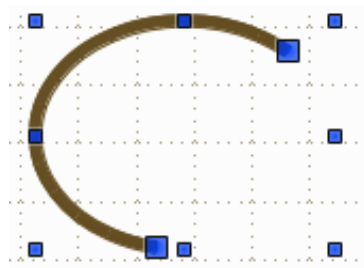


Figure 8: Modifying an arc

Rotating and slanting an object

Rotating an object

To rotate an object (or a group of objects), select the object, then go to rotation mode using one of the following methods:

- Click on the object again. Do not double-click as this will cancel object selection.

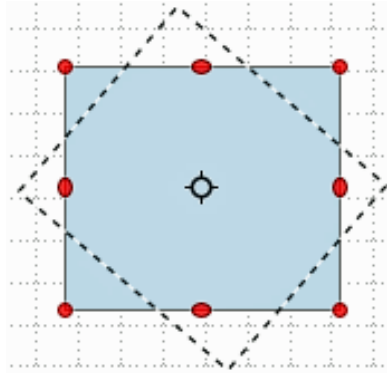




Figure 9: Rotating an object

- Click on the Rotate icon  on the Drawing toolbar.
- Go to **View > Toolbars > Mode** and select the Rotate icon .

The selection handles will change shape and color (Figure 9). Also a center of rotation point will appear in the center of the object. As you move the mouse cursor over the handles, the cursor changes shape. The corner handles are for rotating the object, and the top, bottom and side handles are to shear or slant the object.

Move the mouse cursor to one of the corner handles and it normally changes to an arc with an arrow at each end. Click and hold the mouse button, then start to move the cursor to rotate the object. A dotted outline of the object being rotated appears and the current angle of rotation is shown in the status bar.

Note

Rotation works in a slightly different way for 3D objects because it occurs in a three dimensional space and not in a single plane. See *Chapter 7 Working with 3D Objects* for more information.

The rotation point is normally located at the center of an object. To change the position of the rotation point, click on the object with the mouse cursor and drag the object until the rotation point is at the desired position. This rotation point can even be outside of the object.

Note

If you press the *Shift* key while rotating an object, rotation will be restricted to 15° of movement.

This is the default behavior of the *Shift* key. However, if *When creating or moving objects* has been selected in **Tools > Options > LibreOffice Draw > Grid**, the action of the *Shift* key is reversed: that is rotation will be restricted to 15° of movement *unless* the *Shift* key is pressed.

Slanting an object

To slant an object, use the handles located at the midpoints on the top, bottom and sides of a selected object. The mouse cursor changes when it hovers over one of these midpoint handles. The axis used for slanting an object is the object edge directly opposite the midpoint handle being used to slant the object. This axis stays fixed in location while the other sides of the object move in relation to it as you drag the mouse cursor.

Click and hold the mouse button, then start to move the cursor to shear the object. A dotted outline of the object being slanted appears (Figure 10) and the current angle of slanting is shown in the status bar.

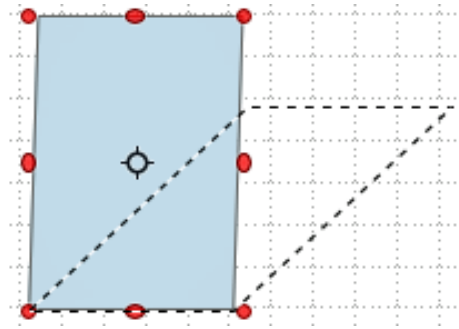


Figure 10: Shearing an object

Note

If you press the *Shift* key while slanting an object, slanting will be restricted to 15° of movement.

This is the default behavior of the *Shift* key. However, if *When creating or moving objects* has been selected in **Tools > Options > LibreOffice Draw > Grid**, the action of the *Shift* key is reversed: that is slanting will be restricted to 15° of movement *unless* the *Shift* key is pressed.

Setting exact size and position

You can position and resize objects with the mouse, but this method is not exact. If you want to accurately position and size an object, go to **Format > Position and Size** on the main menu bar, or right-click on an object and select **Position and Size** from the context menu, or press the *F4* key. This will open the **Position and Size** dialog (Figure 11).

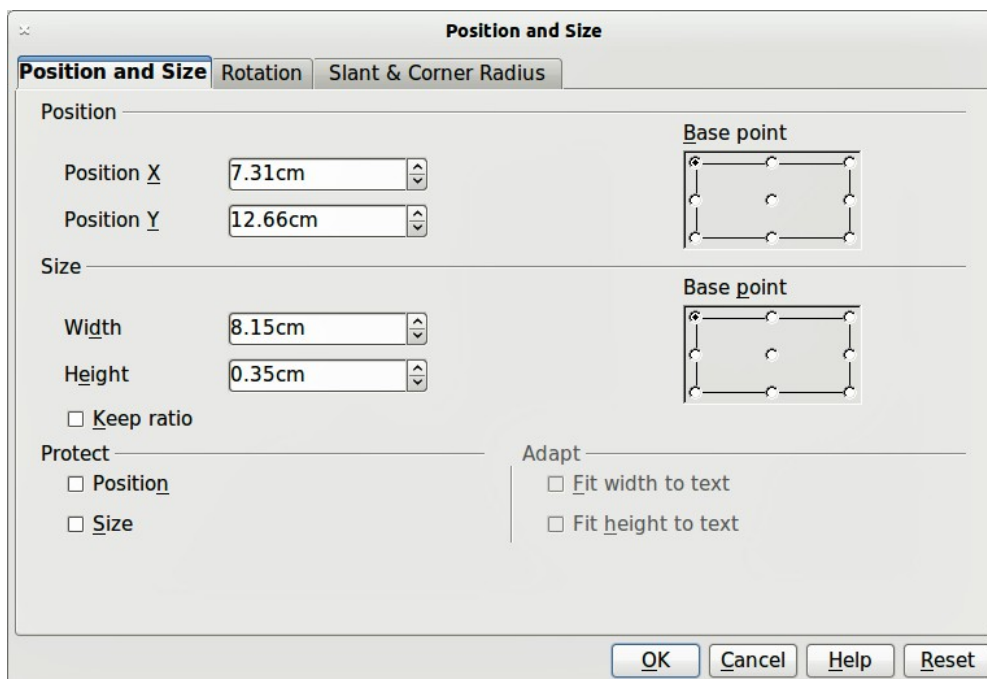


Figure 11: Position and Size dialog

Position and Size

Open the **Position and Size** dialog and click on the *Position and Size* tab (Figure 11) to set the appropriate values.

Position is defined using X/Y coordinates relative to a base point. Change the X/Y coordinates using the text boxes in the *Position* section.

Width and height of an object are also defined relative to a base point. Change the width and height of an object using the text boxes in the *Size* section. To keep the ratio of width to height, select the *Keep ratio* option.

The units of measurement used for X/Y coordinates and the width and height of the object are set by going to **Tools > Options > LibreOffice Draw > General**.

The default location of the base points for position and size is the upper left corner of the drawing area. You can temporarily change this base point to make positioning or dimensioning simpler by clicking on a radio button corresponding to the location of the base point you want to use. This change in base point is only valid for single use and the base point is reset to the standard position of top left corner when you close the Position and Size dialog.

To prevent either or both size and position from being inadvertently changed, select the appropriate options in the *Protect* section.

Rotating objects

To accurately rotate an object, click on the **Rotation** tab of the **Position and Size** dialog (Figure 12). Use this dialog to define the rotation angle and the location of the pivot point.

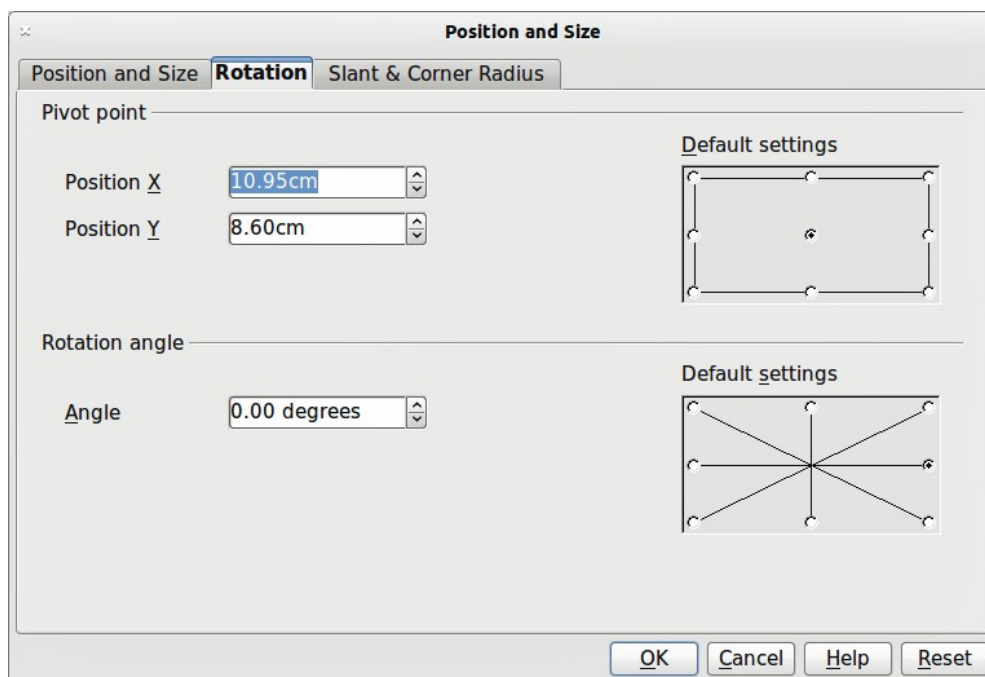


Figure 12: Rotating an object

The pivot point is positioned using X/Y coordinates that are relative to the original position of the pivot point. The default setting for the pivot point is the center of an object. To move this pivot point, click on one of the radio buttons in *Default settings*.

The rotation angle can be accurately set using the text box in the *Rotation angle* section. To quickly rotate an object in increments of 45 degrees, click on one of the radio buttons in the *Default settings*. The default setting for rotation is zero degrees.

Changing the pivot point and/or rotation angle of an object is only valid for single use. The pivot point and rotation angle are reset to their default settings when you close the Position and Size dialog.

Slant and corner radius

To accurately set the corner radius or slant angle of an object, click on the **Slant & Corner Radius** tab of the **Position and Size** dialog (Figure 13).

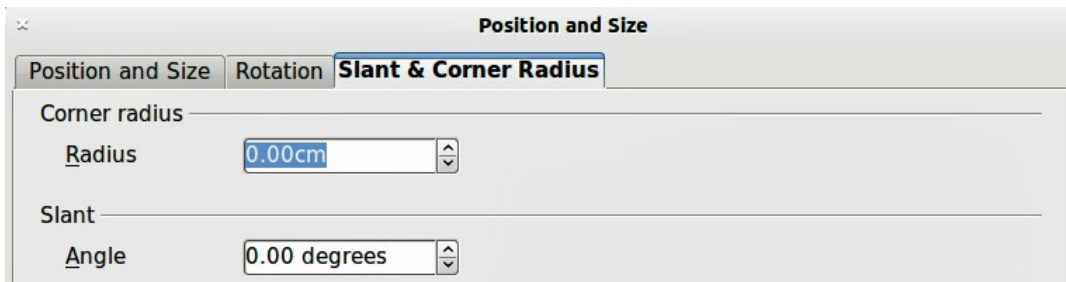


Figure 13: Setting slant angle and corner radius

A corner radius can be applied to any object that has sharp corners, such as rectangles, squares, or text boxes. If the *Corner radius* section is grayed out, then you cannot set a corner radius. The larger the value for corner radius set in the *Radius* text box, the rounder the corners of an object become.

Slant angle relates to how much an object inclines or slants from its normal vertical position on a drawing. To accurately change the slant angle of an object, enter the number of degrees in the *Slant Angle* text box.

Using grid and snap functions

In Draw, you can also position objects accurately and consistently using grid points, snap points and lines, object frames, individual points on objects, or page edges. This function is known as *Snap*.

It is easier to use snap functions at the highest practical zoom value for your drawing. You can use two different snap functions at the same time; for example, snapping to a guide line and the page edge. However, it is recommended to activate only those snap functions that you really need.

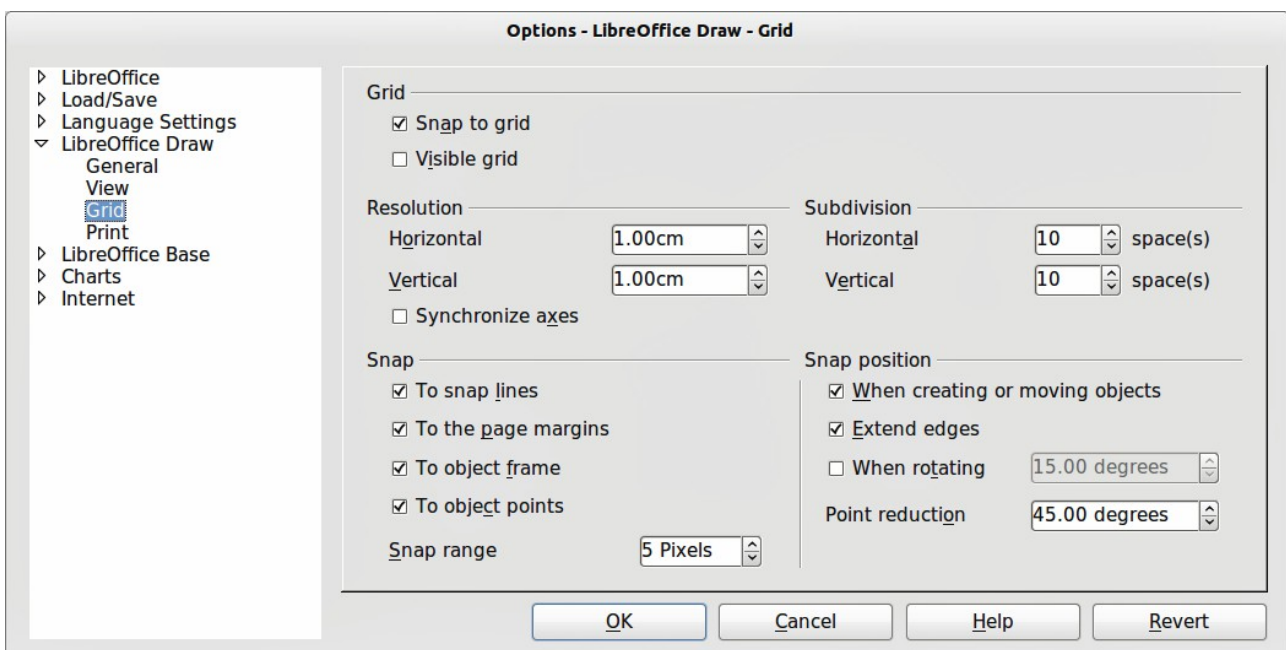


Figure 14: LibreOffice Draw Grid dialog



Figure 15: Options toolbar

Configuring grid and snap functions

To configure the grid and snap functions in your drawing, go to **Tools > Options > LibreOffice Draw > Grid** to display the **Grid** dialog (Figure 14). The grid and snap functions can also be displayed and switched on or off using this dialog, right-clicking on your drawing and using the options in the context menu, or using the icons in the **Options** toolbar (Figure 15). If the Options toolbar is not open, go to **View > Toolbars > Options**.

Grid

- *Snap to grid* – specifies whether to move frames, drawing elements, and controls only between grid points. To change the status of the snap grid only for the current action, drag an object while holding down the Control key.
- *Visible grid* – specifies whether to display or turn off the grid. It is also possible to toggle displaying the grid with **Grid > Display Grid** in the context menu when you right-click on your drawing page. You can also select **Grid > Grid to Front** in this context menu to display the grid in front of objects.

Resolution

- *Horizontal* – defines the unit of measure for the spacing between grid points on the X-axis.
- *Vertical* – defines the grid points spacing in the desired unit of measurement on the Y-axis.

Subdivision

- *Horizontal* – specify the number of intermediate spaces between grid points on the X-axis.
- *Vertical* – specify the number of intermediate spaces between grid points on the Y-axis.
- *Synchronize axes* – specifies whether to change the current grid settings symmetrically. The resolution and subdivision for the X and Y axes remain the same.

Snap

- *To snap lines* – snaps the edge of a dragged object to the nearest snap line when you release the mouse. You can also define this setting by using the **Snap to Snap Lines** icon



on the Options toolbar.

- *To the page margins* – specifies whether to align the contour of the graphic object to the nearest page margin. The cursor or a contour line of the graphics object must be in the snap range. In a drawing, this function can also be accessed with the **Snap to Page**

Margins icon



in the Options toolbar.

- *To object frame* – specifies whether to align the contour of the graphic object to the border of the nearest graphic object. The cursor or a contour line of the graphics object must be in the snap range. In drawing, this function can also be accessed with the **Snap to Object**


Border icon



in the Options toolbar.

- *To object points* – specifies whether to align the contour of the graphic object to the points of the nearest graphic object. This only applies if the cursor or a contour line of the graphics

object is in the snap range. In a drawing, this function can also be accessed with the **Snap**

to Object Points icon  in the Options toolbar.

- *Snap range* – defines the snap distance between the mouse pointer and the object contour. Snaps to a snap point if the mouse pointer is closer than the distance selected.

Snap position


- *When creating or moving objects* – specifies that graphic objects are restricted vertically, horizontally or diagonally (45°) when creating or moving them. You can temporarily deactivate this setting by pressing the *Shift* key.
- *Extend edges* – specifies that a square is created based on the longer side of a rectangle when the *Shift* key is pressed before you release the mouse button. This also applies to an ellipse (a circle will be created based on the longest diameter of the ellipse). When *Extend edges* is not selected, a square or a circle will be created based on the shorter side or diameter.
- *When rotating* – specifies that graphic objects can only be rotated within the rotation angle that you selected. If you want to rotate an object outside the defined angle, press the *Shift* key when rotating. Release the key when the desired rotation angle is reached.
- *Point reduction* – defines the angle for point reduction. When working with polygons, you might find it useful to reduce their editing points.

Snap to grid

Using Snap to Grid


Use the **Snap to Grid** function to move an object exactly onto a grid point in your drawing. This function can be switched on and off using one of three methods:

- 1) Go to **View > Grid > Snap to Grid**.
- 2) Right-click on your drawing and selecting **Snap to Grid** from the context menu.

- 3) Click on the **Snap to Grid** icon  on the Options toolbar.

Displaying the grid

Displaying or turning off the grid in your drawing can be done using one of four methods:

- 1) Go to **View > Grid > Display Grid**.
- 2) Click on the **Display Grid** icon  on the Options toolbar.
- 3) Right-click on your drawing and select **Display Grid** from the context menu.
- 4) Selecting *Visible grid* option in the Grid dialog (Figure 14 on page 9).

Changing color of grid points

By default the grid points are gray and, depending on you display and computer setup, are not always easy to see. Go to **Tools > Options > LibreOffice > Appearance** to open the **Appearance** dialog (Figure 16). In the *Drawing/Presentation* section, change the color of the grid points selecting a more suitable color from the drop down list for you to use.

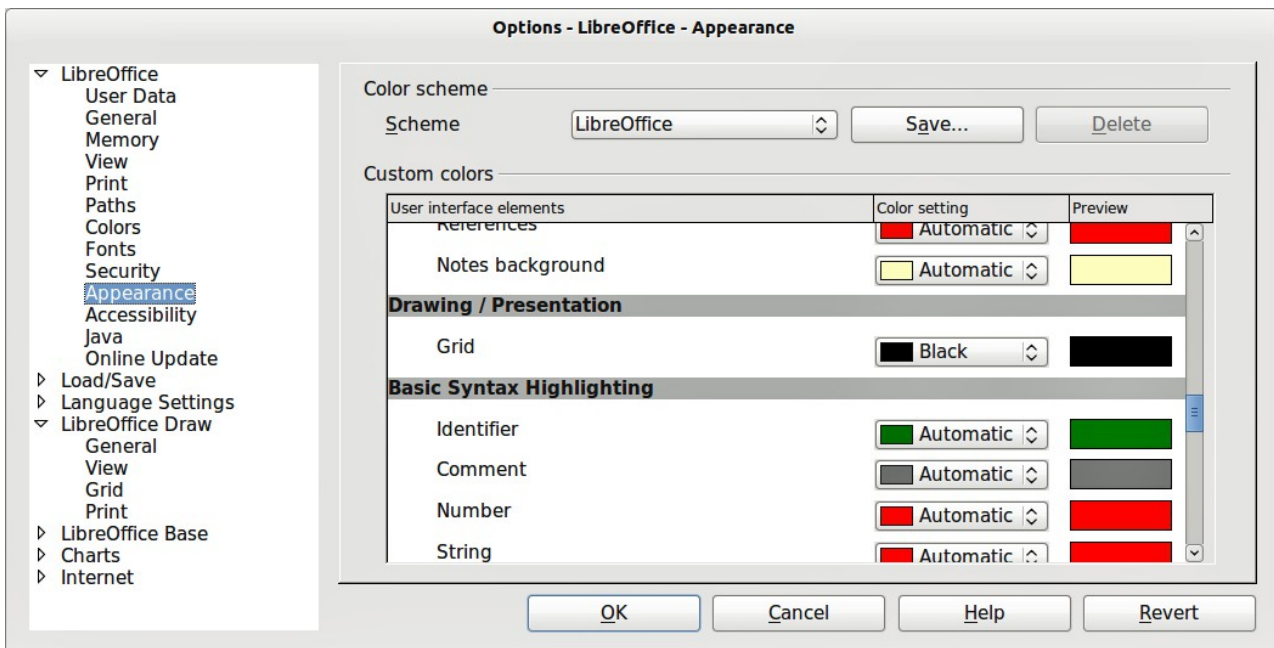


Figure 16: LibreOffice Appearance dialog

Snap points and lines

Unlike the grid, snap lines and snap points are inserted by you when you want to position an object in a specific position on your drawing. Snap lines can either be horizontally or vertically and appear as dashed lines. Snap points appear as small crosses with dashed lines. Snap points and snap lines do not appear in printed output.

You can insert snap lines and snap points in two ways:

- Using the **Insert Snap Point/Line** command.
- Using the vertical and horizontal rulers (snap lines only).

Inserting snap points and snap lines

To insert a snap point or snap line, go to **Insert > Insert Snap Point/Line** or right-click on your drawing and select **Insert Snap Point/Line** from the context menu to open the **New Snap Object** dialog (Figure 17).

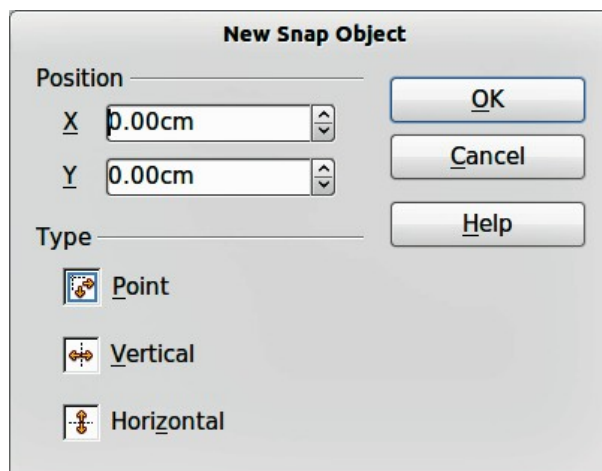


Figure 17: New Snap Object dialog

- **Position** – sets the position of a selected snap point or line relative to the top left corner of the page.
 - *X axis* – enter the amount of space you want between the snap point or line and the left edge of the page.
 - *Y axis* – enter the amount of space you want between the snap point or line and the top edge of the page.
- **Type** – specifies the type of snap object you want to insert.
 - *Point* – inserts a snap point.
 - *Vertical* – inserts a vertical snap line.
 - *Horizontal* – inserts a horizontal snap line.

Inserting snap lines using rulers

Only snap lines can be inserted using the vertical or horizontal rulers. If the rulers are not displayed, go to **Tools > Options > LibreOffice Draw > View** and select *Rulers visible*.

To insert a snap line, move your cursor to a ruler, then click and drag a snap line to the required position.

Displaying snap points and lines

Displaying or turning off snap points and lines in your drawing can be done using one of three methods:

- 1) Go to **View > Grid > Display Snap Lines**.

- 2) Click on the **Display Snap Lines** icon  on the Options toolbar.

- 3) Right-click on your drawing and select **Display Snap Lines** from the context menu.

Editing snap points and lines

To edit a snap point, right-click on the snap point and select **Edit Snap Point** to open the edit dialog or drag it to a new position on your drawing.

To edit a snap line, right-click on the snap line and select **Edit Snap Line** to open the edit dialog or drag it to a new position on your drawing.

Deleting snap points and lines

To delete a snap point, drag it back to a ruler or right-click on the snap point and select **Delete Snap Point**.

To delete a snap line, drag it back to the ruler or right-click on the snap line and select **Delete Snap Line**.

Configuring snap range

To configure the snap range of when an object snaps to position, go to **Tools > Options > LibreOffice Draw > Grid** (Figure 14 on page 9) and enter the number of pixels to set the proximity of when the object will snap into position in the *Snap range* box. The default setting is 5 pixels.

Using guide lines

Guide lines are another function in Draw to help you position objects. Guide lines can be displayed while the object is being moved. They extend from the edges of the object to the rulers at the top and left side of your drawing and do not have a snap function (Figure 18).

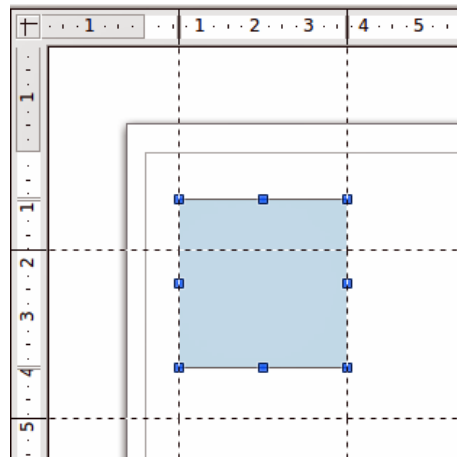


Figure 18: Using guide lines

To use guide lines, go to **Tools > Options > LibreOffice Draw > View** and select the *Snap Lines when moving* option or click the **Helplines While Moving** icon  on the Options toolbar.

Changing form of regular shapes

When drawing certain regular shapes, one or more dots are displayed in a different color to the selection handles when an object is selected. When the mouse cursor hovers over one of these dots, it changes shape. Clicking and dragging on one of these dots modifies the shape of the object. For example, you can increase the corner radius of a rounded rectangle or square, change the angles of an arc, and so on.

These dots perform a different function according to the shape selected and these functions are listed in the following sections.

Basic shapes

- Rounded rectangles and squares: use the dot to change the radius of the curve that replaces the angled corners of a rectangle or square.
- Circle pie: use the dots to change the size of the filled sector.
- Isosceles triangle: use the dot to modify the triangle type.
- Trapezoid, parallelogram, hexagon, or octagon: use the dot to change the angle between the sides.
- Cross: use the dot to change the thickness of the four arms of the cross.
- Ring: use the dot to change the internal diameter of the ring.
- Block arc: use the dot to change both internal diameter and size of the filled area.
- Cylinder and cube: use the dot to change the perspective.
- Folded corner: use the dot to change the size of the folded corner.
- Frame: use the dot to change the thickness of the frame.

Symbol shapes

- Smiley face: use the dot to change the smile on the face.
- Sun, moon, heart: use the dot to change the shape of the symbol.
- Prohibited symbol: use the dot to change the thickness of the ring and the diagonal bar.
- Double bracket, left bracket, right bracket, double brace: use the dot to change the curvature of the bracket.
- Left brace, right brace: use the dots to change the curvature of the brace and the position of the point.
- Square bevel, octagon bevel, diamond bevel: use the dot to change the thickness of the bevel.

Block arrows

- Arrows: use the dot to change the shape and thickness of the arrows.
- Pentagon, chevron: use the dot to change the angle between the sides.
- Arrow callouts: use the dots to change the shape and thickness of the callouts.
- Circular arrow: use the dots to change the thickness and area of the arrow.

Callouts

- Callouts: use the dots to change the length, position and angle of the pointer.

Stars

- 4-point star, 8-point star, 24-point star: use the dot to change the thickness and shape of the star points.
- Vertical scroll, horizontal scroll: use the dot to change the width and shape of the scroll.
- Doorplate: use the dot to change the inward curvature of the corners.

Curves and polygons

Bézier curves

The editing of curves depends on the mathematics of Bézier curves¹. Explaining Bézier curves goes beyond this scope of this guide and only the basics are covered here. See *Chapter 9 Advanced Draw Techniques* for more information on drawing and manipulating Bézier curves.

The editing of a Bézier curve consists in principle of moving points or tangents passing through these points. Each tangent has one control point at each end and a junction point where it meets the curve. The relative angle and distance between the control points determine the shape of the curve. Figure 19 shows what happens starting from a basic circle and changing only one point on the circle.

You can create many different shapes by moving either the junction point itself, or one or both of the round handle points at either end of the tangent. Draw offers more possibilities when you use the functions on the Edit Points toolbar.

¹ Bézier curves were invented by Pierre Bézier, an engineer working with the Renault car manufacturer, who developed the technique in the 1960s. The technology was intended to make modeling the surface of vehicles easier.

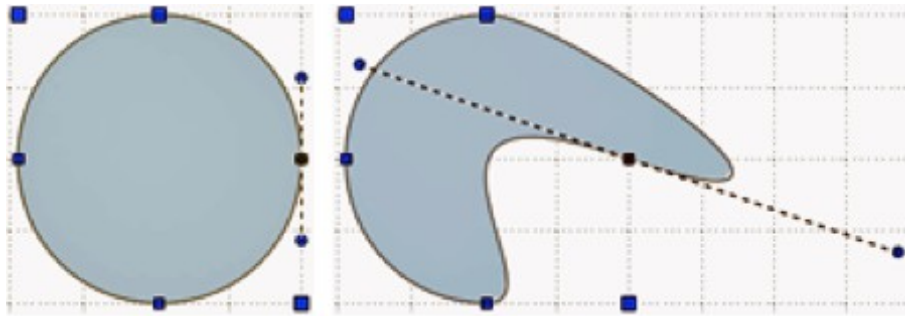



Figure 19: Creating different shapes by changing the tangent

Converting to a curve or polygon


Before modifying the points on an object, it must first be converted to a curve or a polygon, depending on what kind of effect you want to produce.

After selecting an object, go to **Modify > Convert** and select either **To Curve** or **To Polygon**. Alternatively, right-click on an object and then select **Convert > To Curve** or **Convert > To Polygon** from the contextual menu that pops up.

After converting an object to a curve or polygon, click on the Points icon  on the Drawing toolbar; the Edit Points toolbar opens. You can also open this toolbar using **View > Toolbars > Edit Points** on the main menu bar.

You will notice that after the conversion, the handles located in the corners of the selection rectangle have disappeared. This behavior is normal because the handles used with the tools on the Edit Points toolbar are located along the outline or trace of the object.

Edit Points toolbar

Open the Edit Points toolbar (Figure 20) by going to **View > Toolbars > Edit Points** on the main menu bar. It will then appear whenever you select an object that is a curve or polygon and the Edit Points icon  on the Drawing toolbar. Available tools on the Edit Points toolbar will depend on the object selected and which object point has been selected.

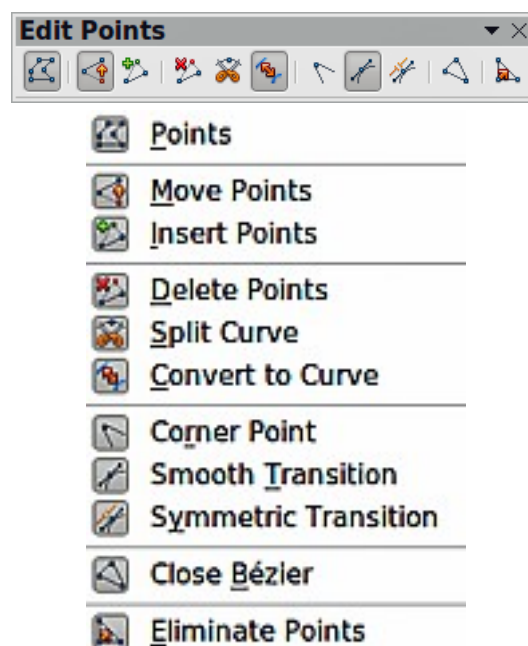


Figure 20: Edit Points toolbar

Tangents

Note

Tangents are only used on curves. If an object has been converted to a polygon and a tangent is added, the object is automatically converted to a curve.

Symmetric transition


Click on the **Symmetric Transition** icon  to work with a symmetrical tangent (Figure 21). Any movement of one tangent handle is carried over symmetrically to the other handle.



Figure 21: Symmetric transition

Smooth transition



Click on the **Smooth Transition** icon  to adjust separately the lengths on each side of a tangent to make a curve flatter or steeper. This creates an asymmetric tangent and the curve is flatter on the longest side of the tangent (Figure 22).



Figure 22: Smooth transition

Corner point

It is possible to change independently the angle on each side of a tangent using the central point of the tangent as a corner point. Select a point on the curve, then click on the **Corner Point** icon  to create a corner point from the selected point (Figure 23). When a corner point is created, you can change the angle on each tangent side to create spikes and troughs in curves.

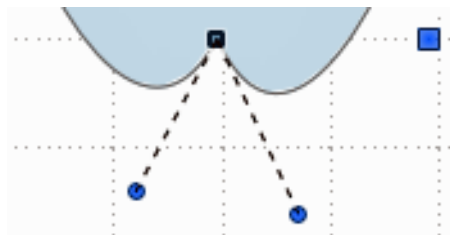


Figure 23: Corner point

Tangent rotation

You can alter the angle by which a tangent relates to curve by clicking on one of the end points of the tangent and rotating it with the mouse cursor. As you change the angle of the tangent, the shape of the curve changes in response (Figure 24).

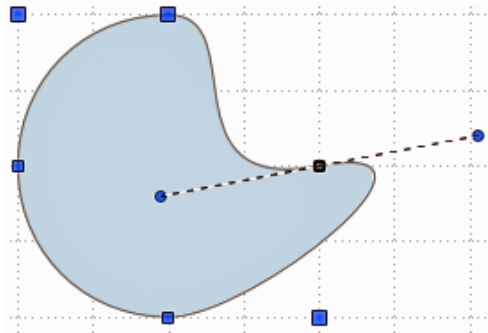



Figure 24: Tangent rotation

Points

Moving points

Click on the **Move Points** icon  to move any of the points when an object has been converted to a curve or polygon. When Move Points is active, the mouse cursor changes shape when it hovers over a point. Moving a point is an easy manipulation to carry out. Figure 25 illustrates how an ovoid or egg shape was created from a circle by dragging the right hand side point to the right.

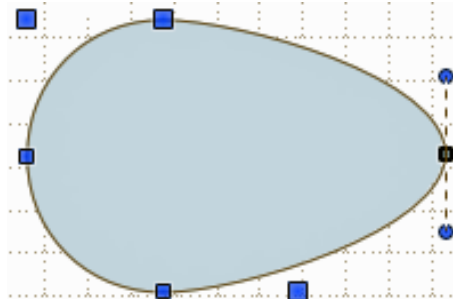



Figure 25: Moving points

Inserting points

Click on the **Insert Points** icon  to add an extra point to an existing curve or polygon. Click on the object border at the spot where you want to insert a point. The tangent type associated with the new point depends on where the point has been added to the object border. Figure 26 shows a new point added to the top right of an ovoid shape.

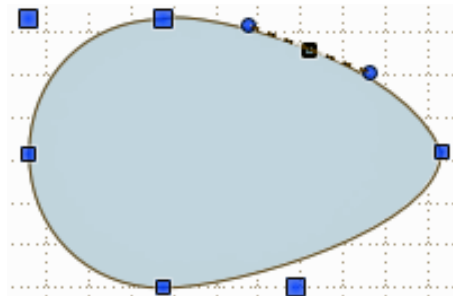



Figure 26: Inserting points

Deleting points

Clicking on the **Delete Points** icon  removes a point from the border of an object. The resulting curve automatically changes shape around the remaining points. Figure 27 shows what happens when the right point was deleted from a circle. You can select several points by holding down the *Shift* key, then click on the Delete Points icon. You can also delete selected points by pressing the *Del* key on the keyboard.

If a curve has been converted to a line (see “Converting curves or lines” on page 20) and selected points are deleted, a straight line is formed between the two points on either side of the now deleted points.

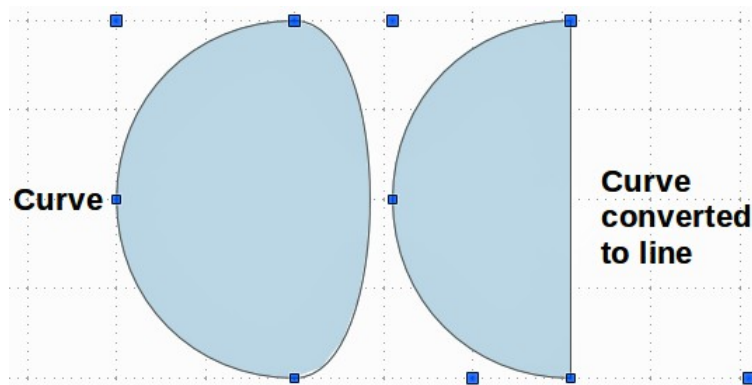




Figure 27: Deleting points

Eliminating points

The **Eliminate Points** icon  only functions on lines with multiple points. These lines are created when a curve is converted to a line using the **Convert to Curve** icon  on the Edit Points toolbar (see “Converting curves or lines” on page 20).

The process of eliminating points from a line to create a straight line is shown in Figure 28.

- 1) Select a line with multiple points and click on the Points icon on the Drawing toolbar. The Edit Points toolbar should open. If it does not open, then go to **View > Toolbars > Edit Points** on the main menu bar to open it.
- 2) Use the mouse cursor to select the point on the line that you want to eliminate. The selected point will be emphasized.
- 3) Make sure the **Eliminate Points** icon is active. The area around the icon becomes shaded when active. If it is not active, click on the Eliminate Points icon.
- 4) Accurately position the mouse cursor over the selected point, then click and hold the mouse button and start dragging the selected point. As you drag, a dotted line forms between the two neighboring points.
- 5) When this dotted line appears to be a straight line between the two neighboring points, release the mouse button. The selected point has been eliminated and a straight line now exists between the two neighboring points.

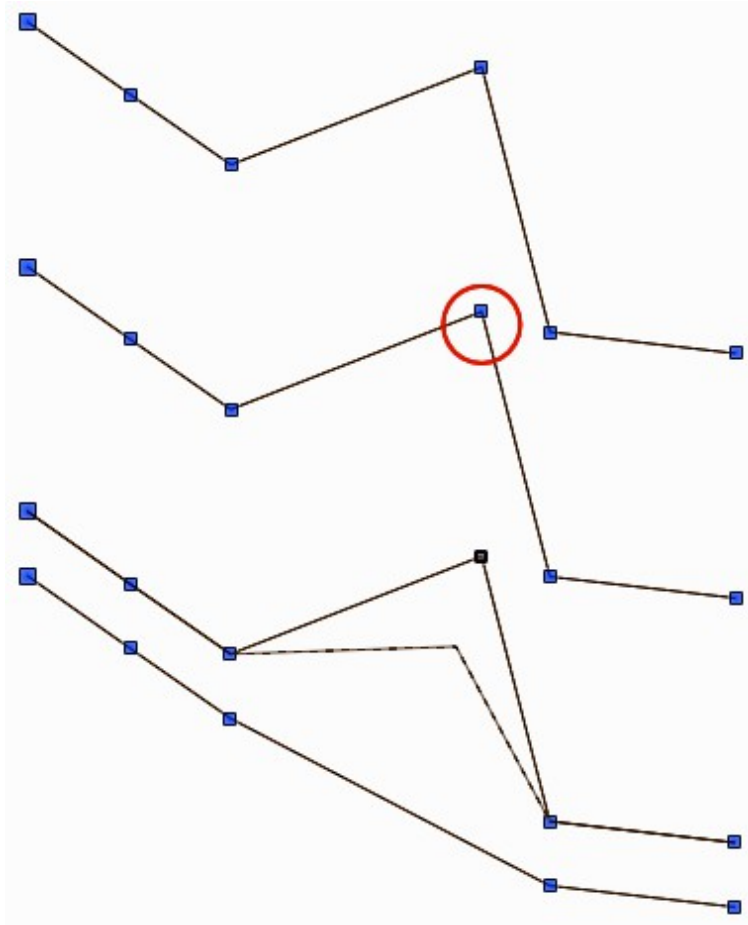



Figure 28: Eliminating points

Converting curves or lines

Curves and lines can be easily converted to each other using the **Convert to Curve** icon  on the Edit Points toolbar. When a curve is converted to a line, a straight line is created between selected points on a curve. When a line is converted to a curve, a curve is created between selected points on a line.

Select a curve or line, then select the points on the curve or line where you want to do the conversion. Click on the **Convert to Curve** icon and the curve or line is converted (Figure 29).

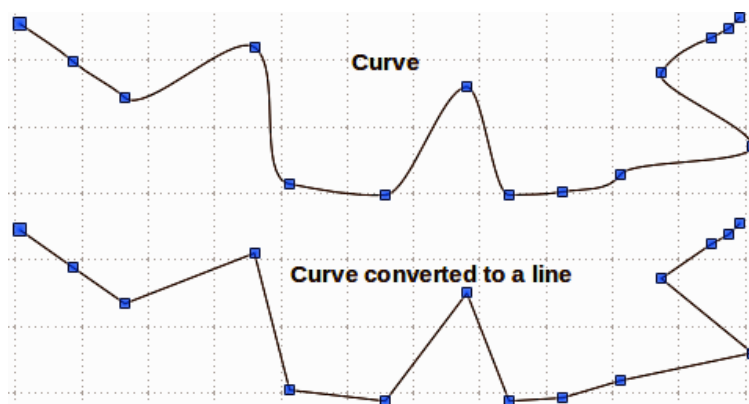



Figure 29: Converting curves and lines

Splitting curves

Click on the **Split Curve** icon  to split or cut a curve at the location of the selected point. If the object is filled, it will be emptied, because the curve that represented the object border is no longer closed (Figure 30).

The point where you split the curve is now larger than the remaining points visible on the curve, (except for the curve start point which is also larger than the other points).

You can separate a curve at several points simultaneously. Keep the *Shift* key pressed down and select all of the points at which the cut should occur, then click on the **Split Curve** icon. Deselect the curve, then drag and drop segments with the mouse to move them away from the original curve.

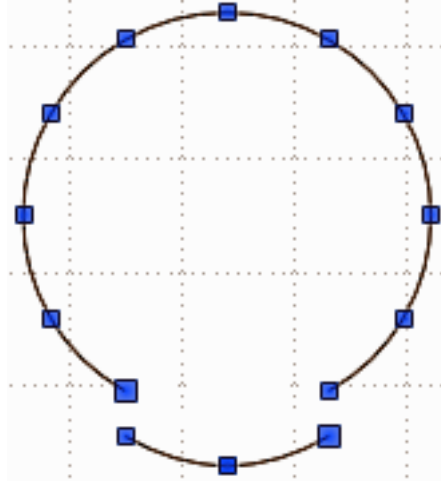



Figure 30: Splitting curves

Closing curves

To close an open and existing curve, first select the open curve, then select the start point of the curve. The start point is larger than the other points visible on the curve. Click on the **Close Bézier** icon  to close the curve (Figure 31).

If the open curve was originally a closed and filled curve, then when the curve is closed again, the original color will fill the curve.

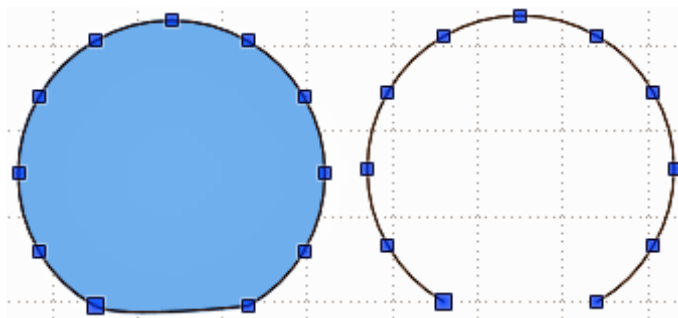



Figure 31: Closing curves

Rotating and distorting curves

To rotate and distort a curve, first select the curve then click on the Rotate icon  on the Mode toolbar. If the Mode toolbar is not open, go to **View > toolbars > Mode** or click on the small triangle or arrow to the right of the **Rotate** icon on the Drawing toolbar. The points on the curve change color and shape (Figure 32).

Select one of the points on the curve and move it by dragging the mouse cursor. Movement will be restricted to the original border of the curve.

Select one of the control points at the end of the tangent line and rotate the distorted curve by dragging the mouse cursor. The distorted curve will rotate about the center of rotation.

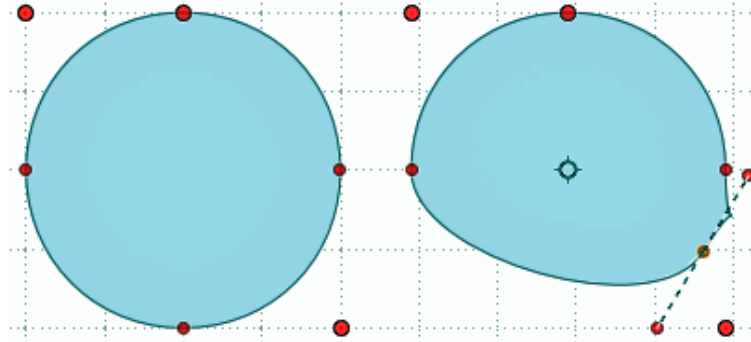


Figure 32: Rotating and distorting curves