

## How to Design Curves

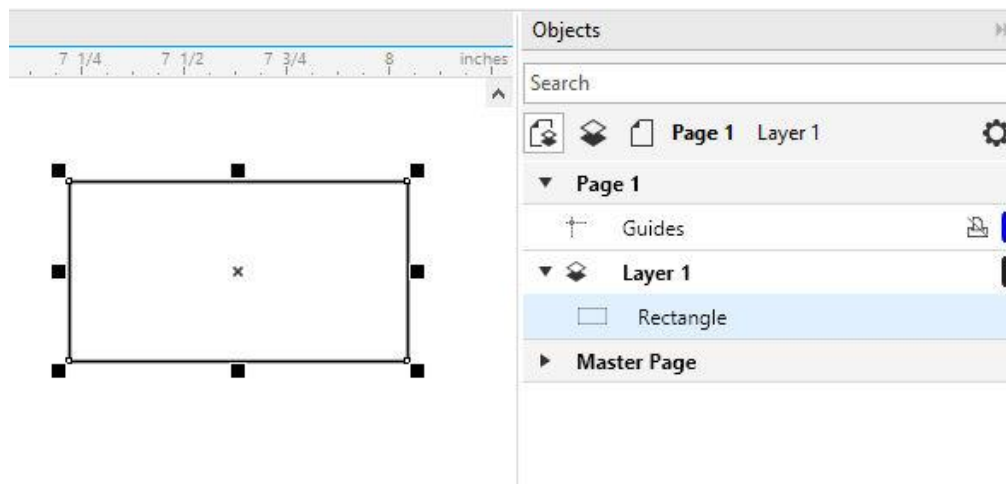
Curves in CorelDRAW can be as simple as a single straight line, or complex open or closed shapes comprised of curved or straight segments. In this tutorial, we'll look at what defines a curve, the various curve drawing tools, and working with the nodes that comprise curves.

### Introduction to Curves

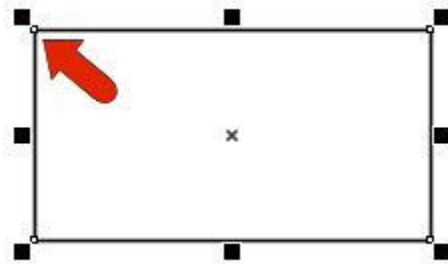
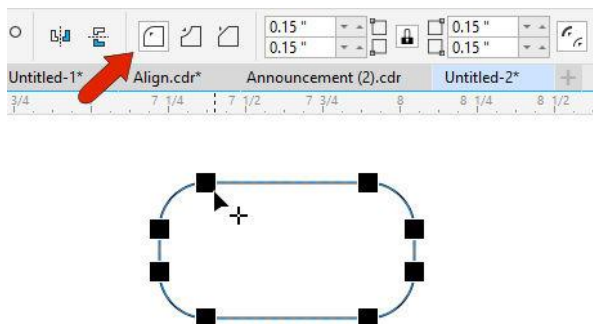
A **curve** is an object that follows a specific path which gives it its defining shape. A curve can be a straight line, an open curved line, or a closed, multi-segment path. Every curve has nodes, which can be displayed and manipulated with the **Shape** tool.

Aside from spirals, freehand lines, and Bezier curves, most CorelDRAW objects are not created as curves.

Here's a rectangle, which is listed as such in the **Objects** docker.

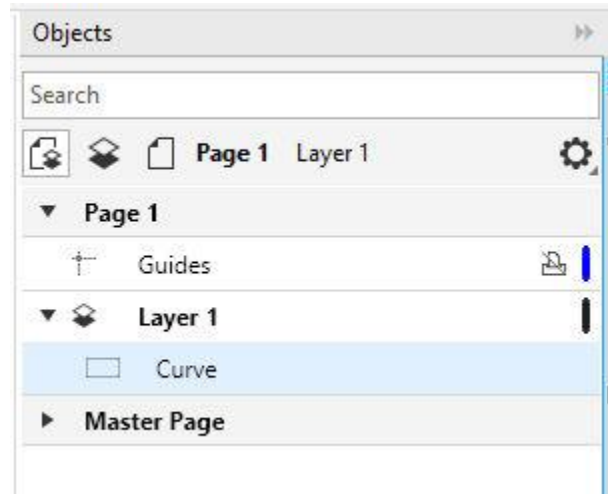


This rectangle has **nodes**, which can be seen when activating the **Shape** tool and clicking the rectangle. But you can't do much with these nodes except change the shape of the corners.



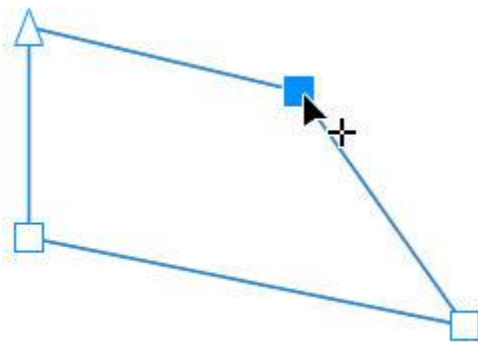
You can also see nodes when selecting the rectangle with the **Pick** tool - they are the tiny white squares. But again, you can't use them to change the shape.

If you want to work with these nodes to change the shape, you first need to convert the rectangle to a curve. Do this by either clicking the **Convert to Curve** icon, by right-clicking and choosing **Convert to Curves**, or pressing **Ctrl + Q**.



Now a **curve** is listed in the **Objects** docker.

When you use the **Shape** tool now, you can access each node individually. Three nodes are white squares, and the arrowhead node at the start or end of the curve is a line node.

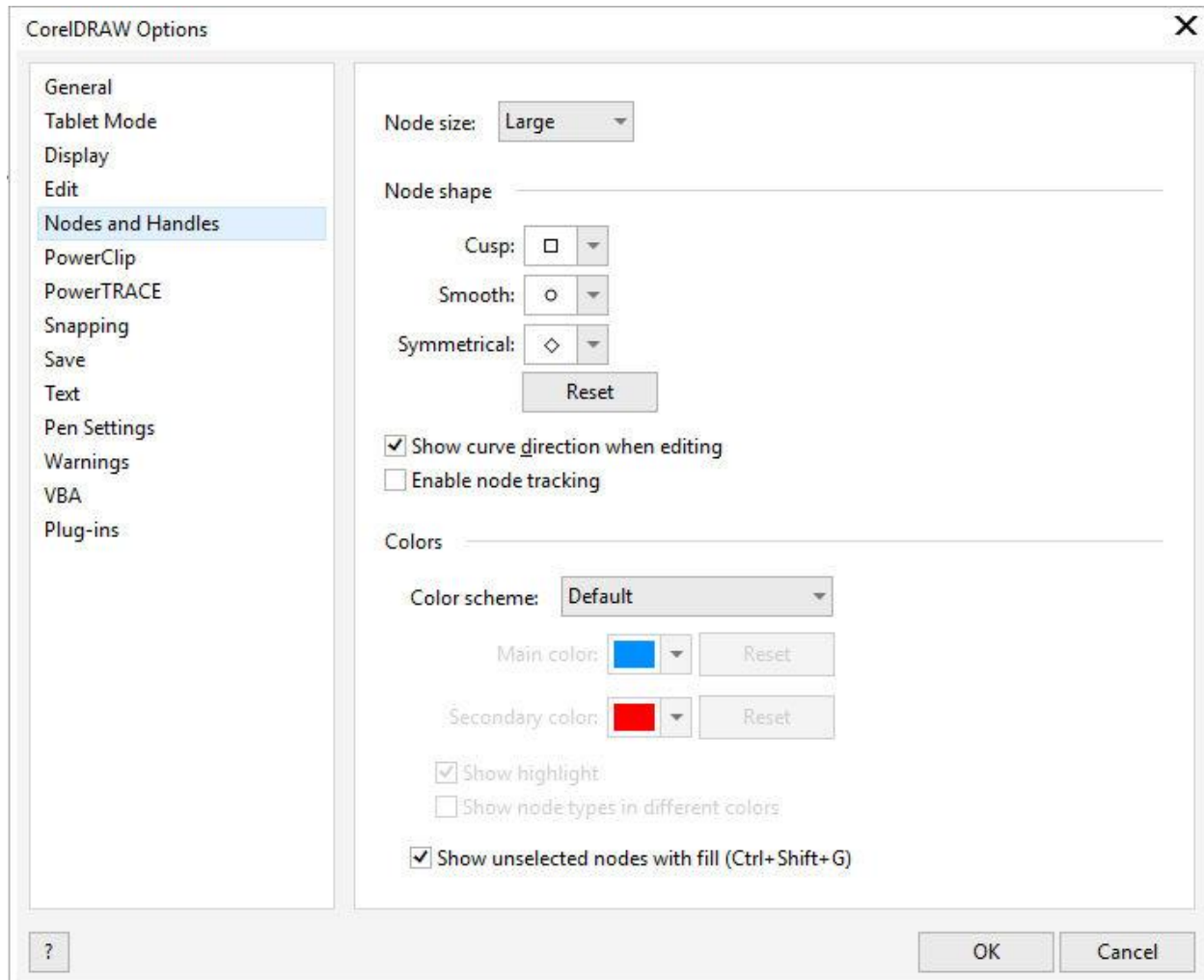


A node you select turns blue, and you can drag nodes to change the shape.

## Manipulating Nodes

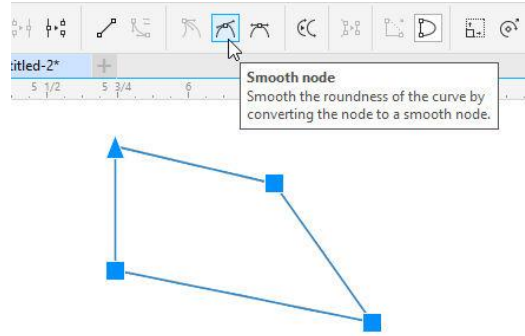
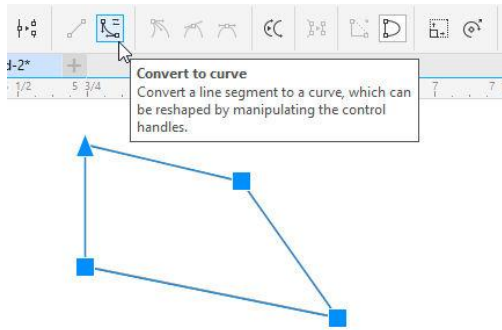
- You can marquee-select multiple nodes
- Delete a node by double-clicking on it
- Add a node by double-clicking along a line or curve

You can change the look of nodes by going to **Tools > Options > CorelDRAW**. On the **Nodes and Handles** tab, you can set node display size and colors. The three shapes represent the three types of nodes: **cusp**, **smooth**, and **symmetrical**.



The square nodes of our rectangle-shaped curve are **cusp** nodes, which means nodes that hold a sharp corner.

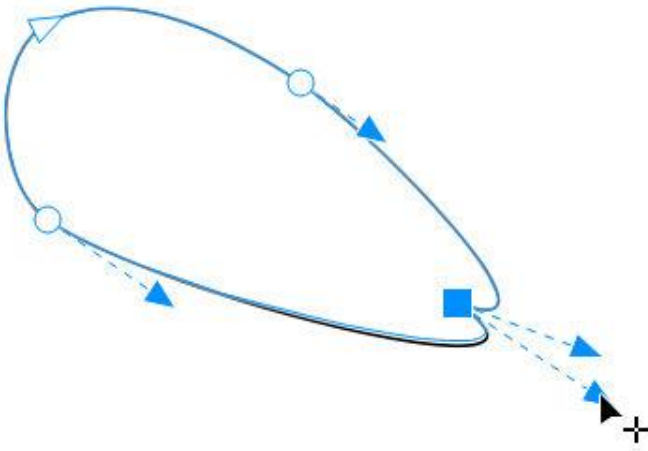
Let's change these to smooth nodes. To do this, we need to convert the straight segments to curves. Select all **nodes** on this object and click **Convert to Curve**. Then click **Smooth node**.



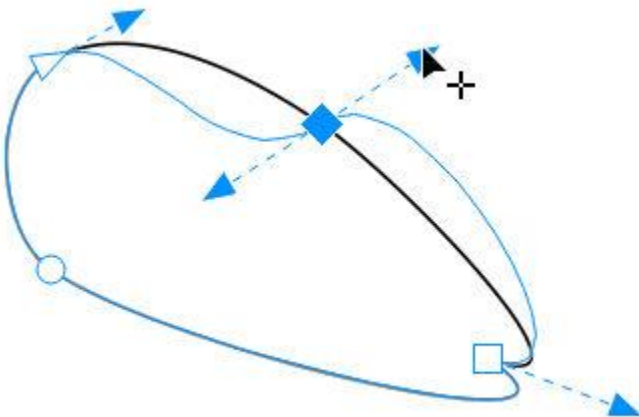
## Working with Nodes

Now all segment transitions are smooth. In addition to moving nodes themselves, you can use a node's **control handles** to control curvature. Right-clicking on a node enables you to change its type, such as changing a **smooth** node to a **cusp**.

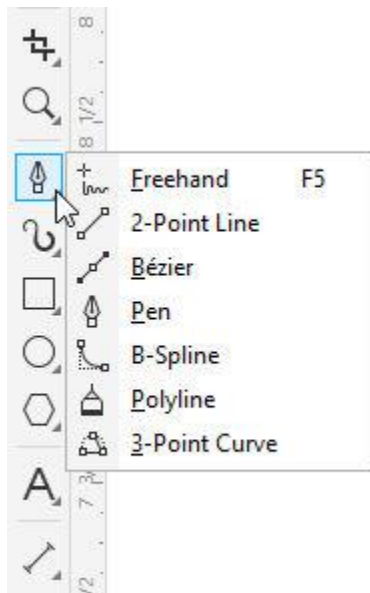
For a **cusp** node, use the control handles to create a sharp corner.



The last node type is **symmetrical**, which has a diamond shape. Symmetrical nodes have the same tangency and curvature on both sides of the node.

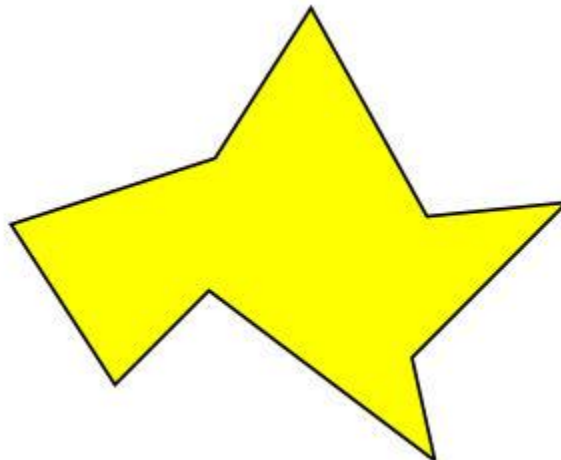


Now that we understand how nodes can be adjusted, let's look at some of the curve drawing tools, which can be found in this flyout toolbar.



The most basic curve tool is **2-Point Line**. You can drag out individual segments, and with the **Shift** key pressed you'll snap to angles at 15-degree increments.

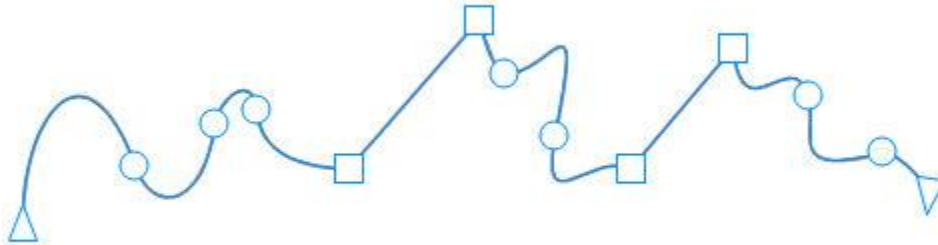
You can also start a next segment at the end node of an existing segment. Once a curve is closed, you can give it a fill.



This object is created as a curve, so you can go straight to the **Shape** tool to start node editing.

For any curve tool, look in the **Property Bar** to see additional options. For **2-Point Line**, there are options to make perpendicular lines, or lines tangent to a curve.

With **Freehand** you can drag to create a curve. If **Shift** is pressed while dragging, the segment will be straight. Nodes are placed where the curves change direction or angle.

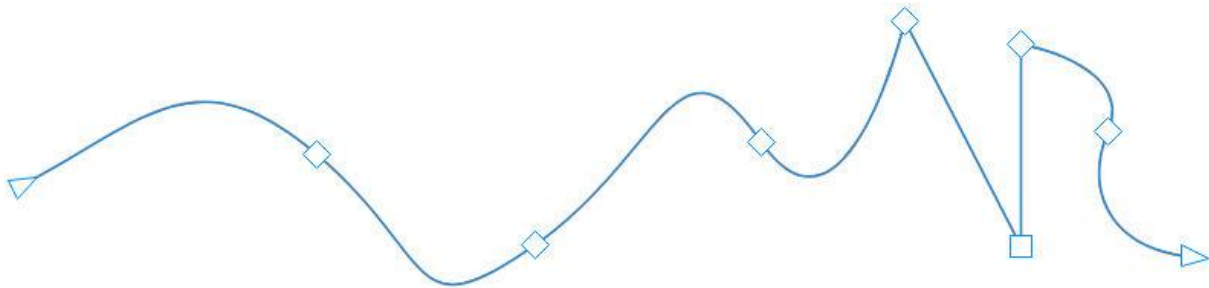


**Polyline** is similar to **Freehand**, except that you can continue drawing multiple connected segments. If you move the mouse instead of dragging, you'll create a straight-line segment. Double-clicking finishes the curve.

With the **Bezier** curve tool, you can click repeatedly to create continuous straight-line segments.

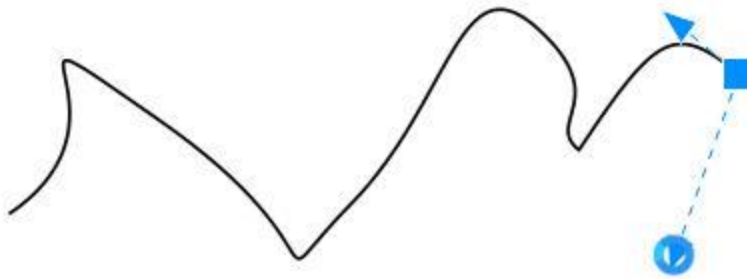
### Creating Curves

To create curves, start by dragging to define the starting direction, then click the next point and drag, and so on. Clicking without dragging adds a straight segment. Pressing the **Spacebar** finishes the curve.



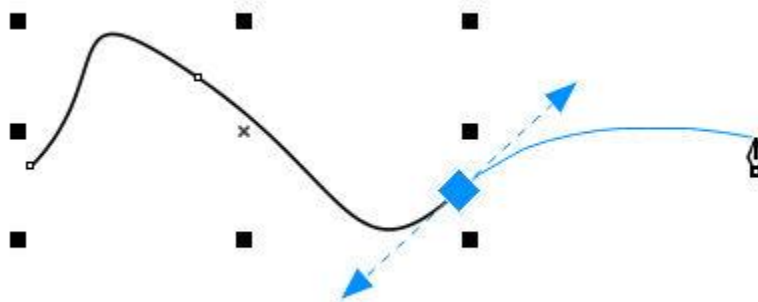
While dragging to adjust curvature, if you press **Shift** you can snap to standard angles. When pressing **Alt** you can move the node itself.

By default, these nodes are **smooth** nodes. But pressing the **C** key while moving a control handle creates a **cusp** node.

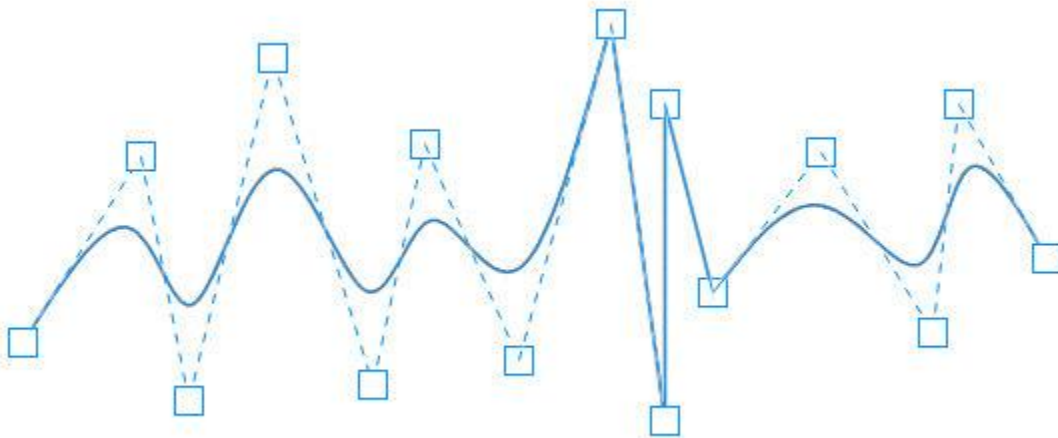


Double-clicking the **Bezier** icon opens the options for this tool, which also apply to **Freehand**. Here you can adjust corners and straight lines, and control auto-join.

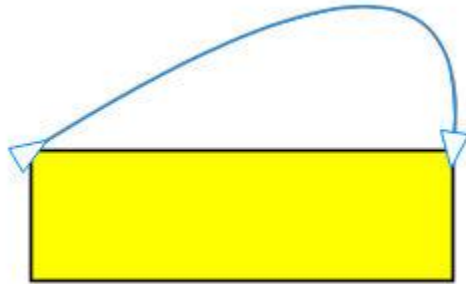
The **Pen** tool is similar to **Bezier** but has the **Preview** mode option. With preview, you can see how the segment will look before you draw it.



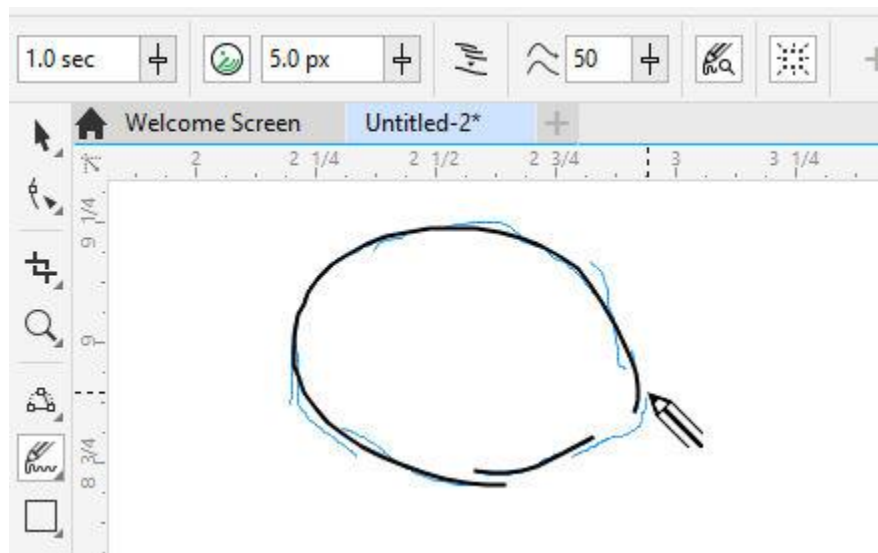
The **B Spline** tool enables you to draw smooth curves, by setting control points that shape the curve without breaking it into segments. By default, the nodes aren't on the curve itself. But if you press the **V** key while clicking points, you'll create straight segments. Double-clicking ends the curve.



The **3 Point Curve** tool is great for drawing arcs without worrying about node control handles. Click and drag between the start and end points, then move the mouse and click the third point.

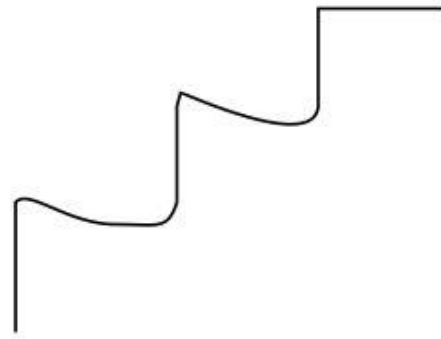
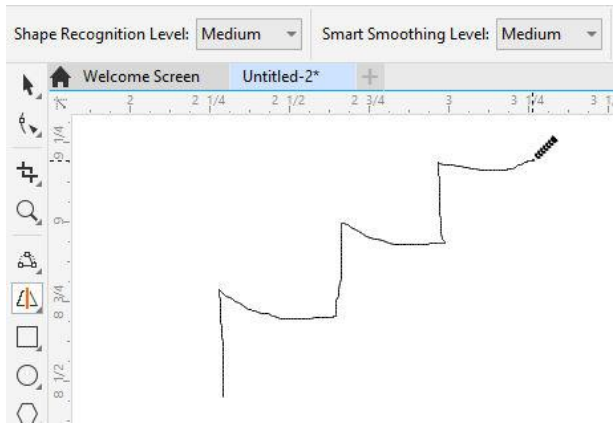


In the next flyout toolbar, **Live Sketch** is great for working with pen tablets, mimicking how you would hand-sketch lines and curves. You can set the timer after which strokes will be converted into curves, as well as the distance from the curve within which new strokes will be added to existing curves



Finally, the **Smart Drawing** tool tries to guess what you're drawing when dragging the mouse. You can adjust the levels of shape recognition and smoothing.

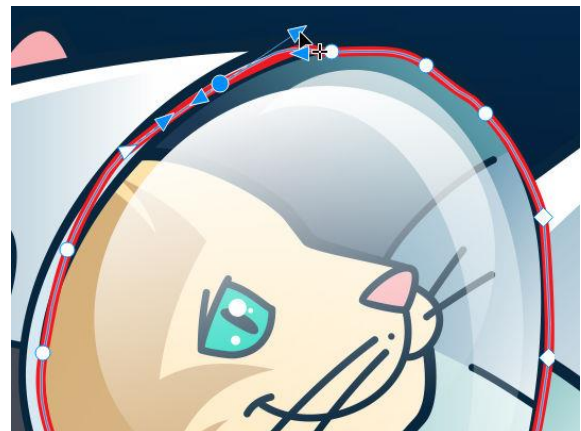




Your **freehand curves** are then converted into **vector lines** or curves.

Once you have a grasp of how curves and nodes work, it's easy to create or trace the exact shape you want.

As an example, say you want to trace around the cat's mask in this document. You can use the **Bezier** tool, setting a red color, and clicking and dragging all the way around, to make a smooth closed curve.



*(Artwork by Francisco Marcos)*

You don't have to worry about being overly exact, because you can use the **Shape** tool to adjust **nodes**, or to **add nodes** where needed.

For another example here's an asteroid imported into the document, which will also be traced. This time **Freehand** is used to trace with line segments, double-clicking after each segment to continue the next segment, and clicking once to close the curve.



Then with the **Shape** tool, select all **nodes** and **convert to curve**, then make the nodes **smooth**.  
Now the nodes can be adjusted to follow the outline.

