
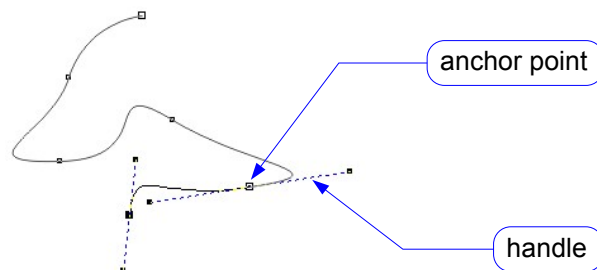

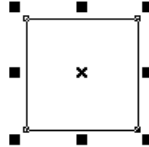


CURVES AND SHAPES

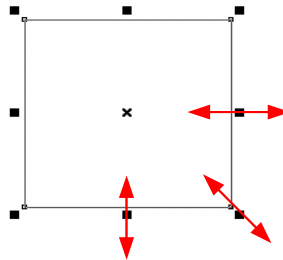
Vector graphics relies on curves and shapes defined internally with appropriate points and line equations. Each line (a line segment) can be straight one or a curve (mutual conversions are possible, e.g. from the context menu). The points between two line segments are referred to as anchor points (anchors) – they are fixed in the coordinate system. A shape of a curve is defined by the anchor points and their handles (responsible for the curve shape between adjacent anchor points). The figure below presents a sample *Bézier*¹ curve with anchor points and editable handles. The Bezier can be found in the *freehand* tool .



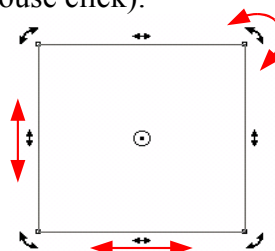
A selected object (the selection tool is ) is marked with black squares as show below:



Multiple objects can be selected either with pointing them with Shift down or by enveloping them with the mouse pointer. A selected object can be scaled:



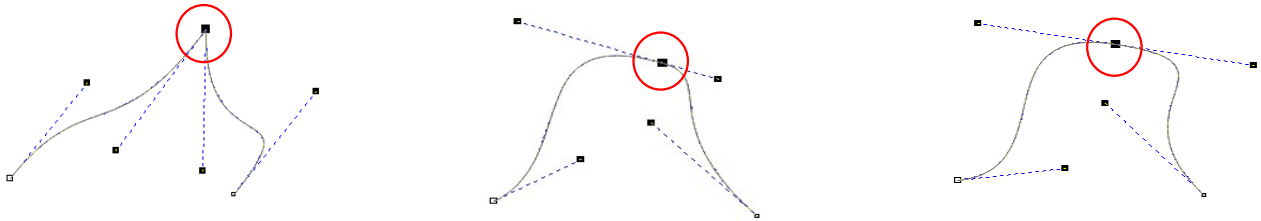
or sheared and rotated (after another mouse click):




Anchor points can be defined as cusp, smooth and symmetrical ones (conversion always possible,





¹ *Bézier curves*, http://en.wikipedia.org/wiki/Bézier_curve


e.g. from the toolbar) shown in the figure below:




Any curve can be edited and its anchor points moved. First, point the curve (the object) with the **selection** tool, then use the **shape** tool  for modifying its anchor points and their handles. This will change the context menu in the toolbar as below

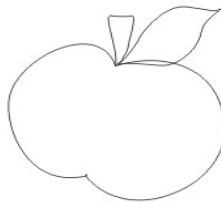


Any selected line segment can be converted to a curve by pressing . In the same manner, any shape that you insert can be converted to a curve by pressing . Any points can be added and removed if necessary (), and change type of points as mentioned above ().

Note: It is advised that the following exercises are done on separate pages. A new page can be added to your project by pressing  on the bottom left hand side of the window, or select „Insert Page ...” from the Layout menu. You can also rename it (click right on the page tag, then select Rename Page...).

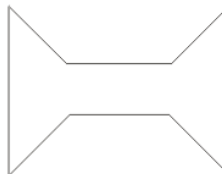
Exercise 1


Draw the apple shape presented below with the free hand tool , edit your curves if necessary. Make sure all the curves are closed.



Exercise 2

Draw the following shape with the **Bézier** tool. Hold Ctrl to ensure straight lines and regular angles.



Note: you can do the same by inserting a rectangle . In the **shape** tool context menu, convert it to curves and add 2 anchor points on each longer side. Then simply move segments between the inserted points achieve the desired shape.

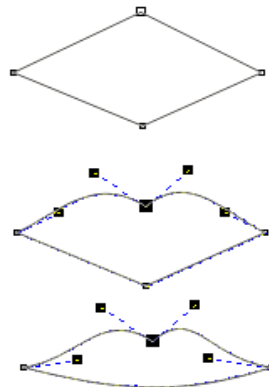
Exercise 3

Draw the butterfly wing shape:




Exercise 4

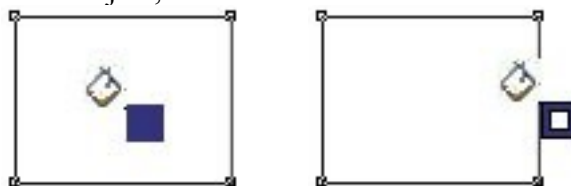
Draw the lips shape from rhombus. You can do it using either *Bezier* curves, or from shapes (polygon with 3 or 4 sides). In latter case, convert into curves and delete points if necessary.



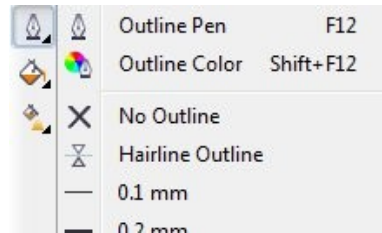
BORDERS AND FILLINGS

Remember that in CorelDRAW only closed curves display their filling.

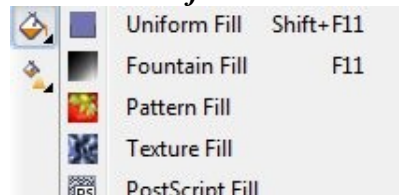
Colours of borders and fillings can be simply selected from the *colour Eyedropper* tool . From the context menu, you can choose to pick colour from objects in your project, or even colours from the desktop. Then, you can apply this colour to the outline or to the interior of the object, depending where is the cursor on the object, as shown below:



More advanced border options are available from the *Outline Pen* tool:



Also advanced object filling can be set from the **fill** tool:

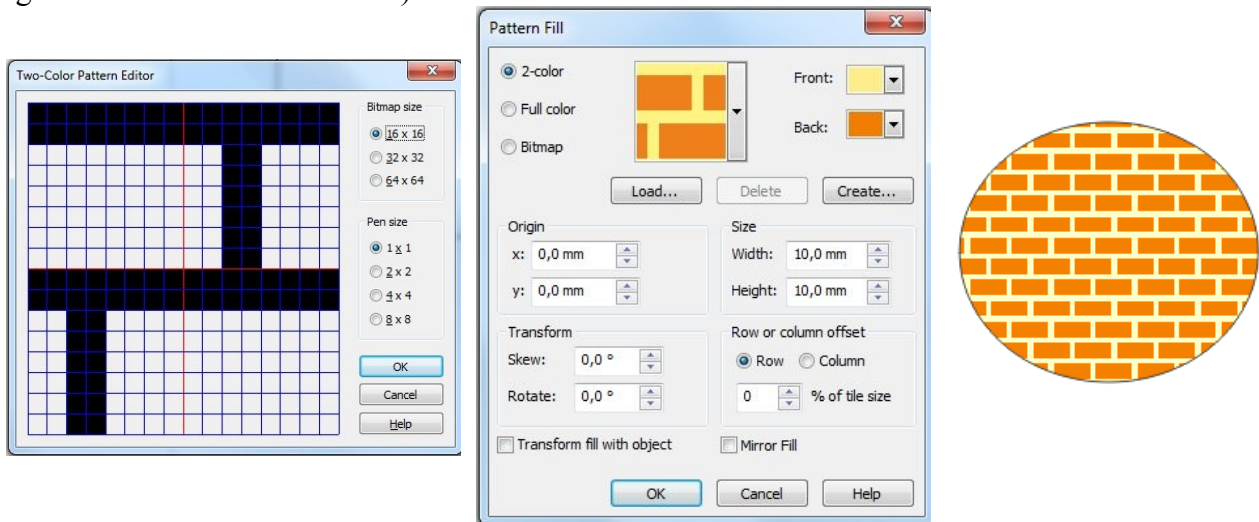


Exercise 5

Fill the apple shape (ex. 1) with simple colours. Then apply gradient fillings.

Exercise 6

You can create your own pattern to fill objects. For that, you will need to select **Pattern fill** from **Fill** tool. In the dialog window, click on **Create...** button. Then, design and apply the pattern filling as shown below (to enable cells, simply left-click on the grid and move the mouse. To disable cells, right-click and move the mouse):

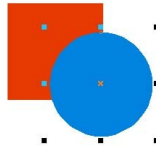


MULTIPLE OBJECTS AND LAYERS

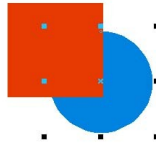
Objects are distributed in the drawing space subsequently, i.e. they cannot occupy the same level. They can be moved up and down and organised in layers. Objects can be also distributed in various ways in the drawing plane.

Exercise 7

Draw a circle and a square as shown below:



Using the context menu move the circle behind the square (the context menu):



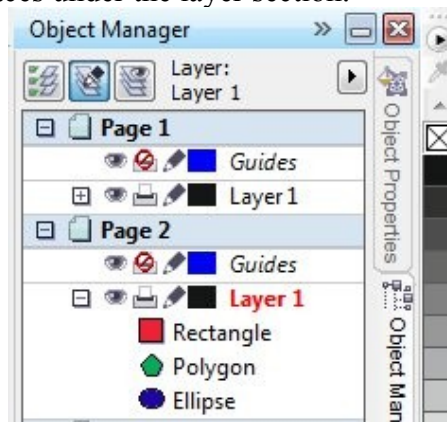
Add another object:



and place it between the circle and the square.

Exercise 8

Use the *object manager* (*tool* menu) to reorganise your objects' order by simply dragging and dropping objects in different places under the layer section.



Exercise 9

Using objects from the previous exercise apply various distributions available from the *Arrange > Order* menu.

Exercise 10

Open the *lab_09a.cdr* file. Using the object manager to perform the following operations:

1. Hide all layers (the eye icon) except for *layer 1*.
2. Move visible objects to appropriate layers (drag&drop):
 - frontiers to *granice*;
 - country names to *nazwy państw*;
 - towns' and cities' names to *nazwy miast*;
 - circles to *oznaczenia miast*;

- lakes to *jeziora*;
- 3. Un-hide *granice*.
- 4. Find in *granice* all frontiers, select and group them.
- 5. Hide *granice*.
- 6. Un-hide *oznaczenia miast*. Select all objects in this layer and make their borders black.
- 7. Un-hide other layers.
- 8. Move the *mapka 1* layer above the *kontynent* layer.