https://github.com/t-o-k/Maxima-bezier/rational_bezier_curves_2d.wxmx

```
(%i1) kill(all)$

(%i1) load("draw")$

(%i2) load("bezier")$

(%i3) tau: 2*%pi$

(%i4) angle: tau/4/2;  /* No. of parts is 4 */
```

(angle) $\frac{\pi}{4}$

```
(%i5) weights: matrix([ 1, cos(angle), 1 ]);
```

(weights) $\begin{pmatrix} 1 & \frac{1}{\sqrt{2}} & 1 \end{pmatrix}$

```
(%i6) points1_x: matrix([ 3, 5, 5 ])$

(%i7) points1_y: matrix([ 2, 2, 4 ])$

(%i8) points2_x: matrix([ 5, 5, 3 ])$

(%i9) points2_y: matrix([ 4, 6, 6 ])$

(%i10) points3_x: matrix([ 3, 1, 1 ])$

(%i11) points3_y: matrix([ 6, 6, 4 ])$

(%i12) points4_x: matrix([ 1, 1, 3 ])$

(%i13) points4_y: matrix([ 4, 2, 2 ])$

(%i14) define(f1_x(s), rational_bezier_function_1a(points1_x, weights, s));
```

(%o14) $$f1_x(s):=\frac{5\,s^2+5\sqrt{2}\,(1-s)\,s+3\,(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

```
(%i15) define(f1_y(s), rational_bezier_function_1a(points1_y, weights, s));
```

(%o15) $$f1_y(s):=\frac{4\,s^2+2^{3/2}\,(1-s)\,s+2\,(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

```
(%i16) define(f2_x(s), rational_bezier_function_1a(points2_x, weights, s));
```

(%o16) $$f2_x(s):=\frac{3\,s^2+5\,\sqrt{2}\,(1-s)\,s+5\,(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

```
(%i17) define(f2_y(s), rational_bezier_function_1a(points2_y, weights, s));
```

(%o17) $$f2_y(s):=\frac{6\,s^2+3\,2^{3/2}\,(1-s)\,s+4\,(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

```
(%i18) define(f3_x(s), rational_bezier_function_1a(points3_x, weights, s));
```

(%o18) $$f3_x(s):=\frac{s^2+\sqrt{2}\,(1-s)\,s+3\,(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

```
(%i19) define(f3_y(s), rational_bezier_function_1a(points3_y, weights, s));
```

(%o19) $$f3_y(s):=\frac{4\,s^2+3\,2^{3/2}\,(1-s)\,s+6\,(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

```
(%i20) define(f4_x(s), rational_bezier_function_1a(points4_x, weights, s));
```

(%o20) $$f4_x(s):=\frac{3\,s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

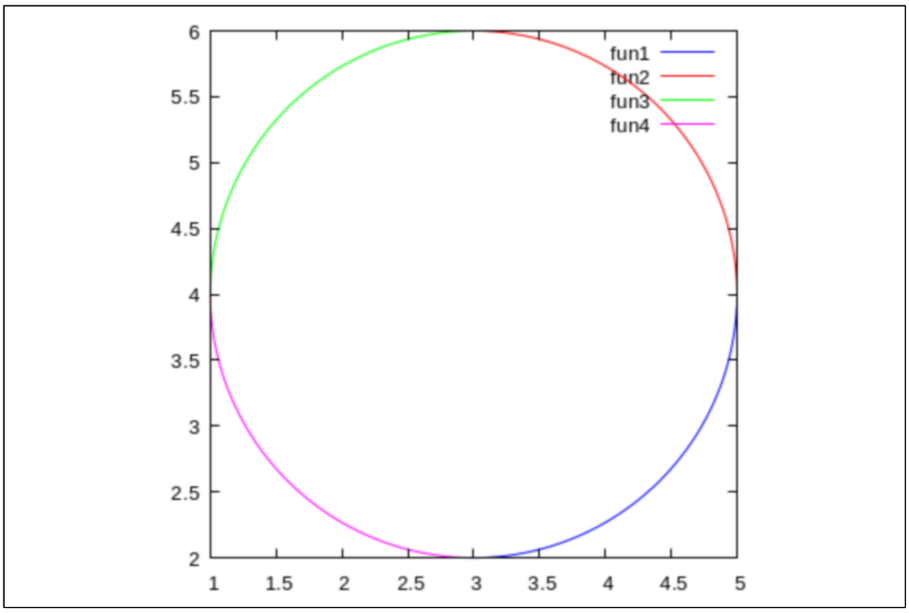
```
(%i21) define(f4_y(s), rational_bezier_function_1a(points4_y, weights, s));
```

(%o21) $$f4_y(s):=\frac{2\,s^2+2^{3/2}\,(1-s)\,s+4\,(1-s)^2}{s^2+\sqrt{2}\,(1-s)\,s+(1-s)^2}$$

```
(%i22) curve_1: [ parametric, f1_x(s), f1_y(s), [ s, 0, 1 ] ]$  /* fun1 */

(%i23) curve_2: [ parametric, f2_x(s), f2_y(s), [ s, 0, 1 ] ]$  /* fun2 */

(%i24) curve_3: [ parametric, f3_x(s), f3_y(s), [ s, 0, 1 ] ]$  /* fun3 */

(%i25) curve_4: [ parametric, f4_x(s), f4_y(s), [ s, 0, 1 ] ]$  /* fun4 */
```

```
(%i26) wxplot2d([ curve_1, curve_2, curve_3, curve_4 ], same_xy);
```

(%t26)



(%o26)