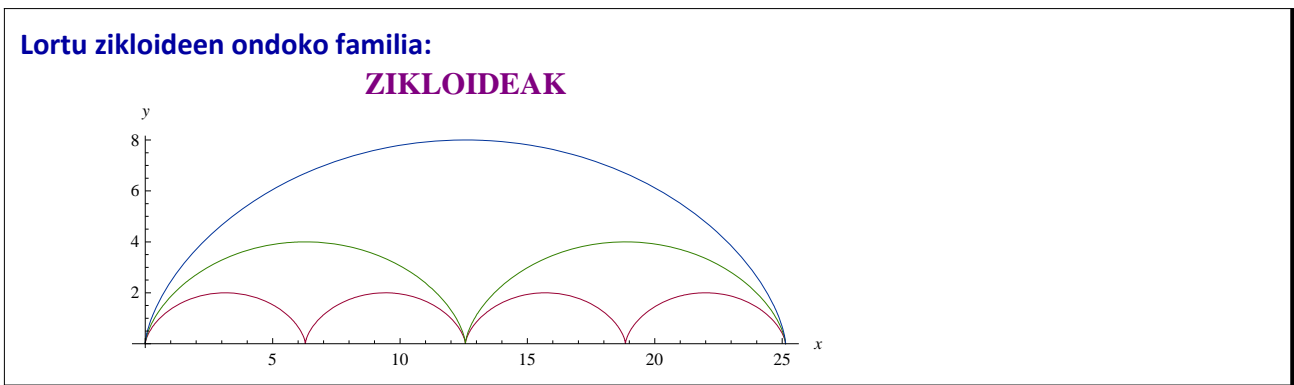


P4

4. PRAKTIKA: KURBEN ADIERAZPENA FORMA PARAMETRIKOAN

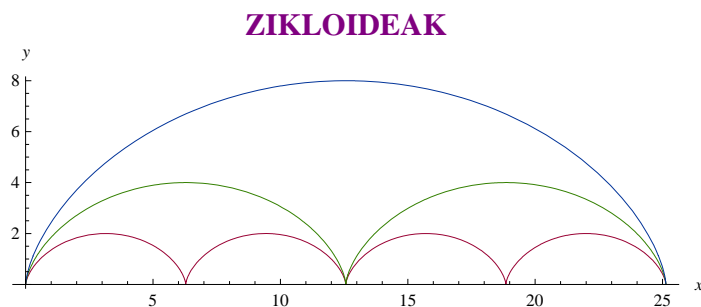
▼ Proposatutako Ariketa P-4.1



▼ Soluzioa P-4.1

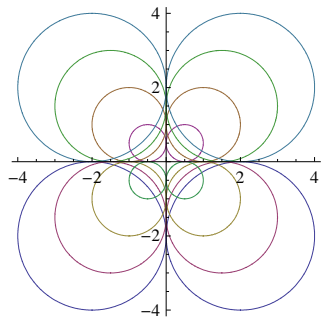
```
Clear["Global`*"]
zikloide[t_, a_] = a * {t - Sin[t], 1 - Cos[t]}
{a (t - Sin[t]), a (1 - Cos[t])}

c1 = ParametricPlot[{zikloide[t, 1]}, {t, 0, 8 * Pi}, PlotStyle -> RGBColor[0.6, 0, 0.2]];
c2 = ParametricPlot[{zikloide[t, 2]}, {t, 0, 4 * Pi}, PlotStyle -> RGBColor[0.2, 0.5, 0]];
c4 = ParametricPlot[{zikloide[t, 4]}, {t, 0, 2 * Pi}, PlotStyle -> RGBColor[0, 0.2, 0.6]];
Show[{c1, c2, c4}, PlotLabel -> Style["ZIKLOIDEAK", Bold, Purple, 16],
  AxesLabel -> {x, y}, PlotRange -> {0, 8}]
```



▼ Proposatutako Ariketa P-4.2

Lortu zirkuluen ondoko familia:



▼ Soluzioa P-4.2

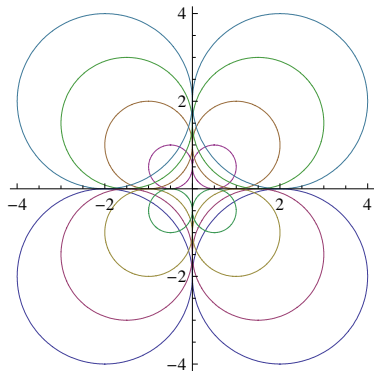
```
zirkulua[t_, a_, b_, r_] = {x[t_], y[t_]} = {a + r * Sin[t], b + r * Cos[t]}
```

```
{a + r Sin[t], b + r Cos[t]}
```

```
c1 = ParametricPlot[Evaluate[Table[zirkulua[t, -i, i, i], {i, -2, 2, 0.5}]],  
  {t, 0, 2 Pi}, AspectRatio -> Automatic];
```

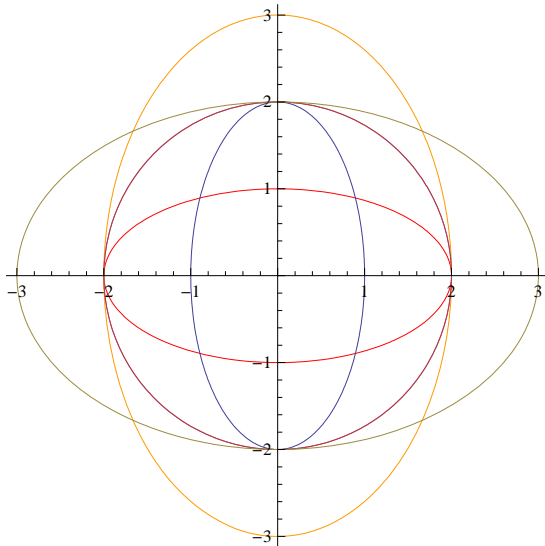
```
c2 = ParametricPlot[Evaluate[Table[zirkulua[t, i, i, i], {i, -2, 2, 0.5}]],  
  {t, 0, 2 Pi}, AspectRatio -> Automatic];
```

```
Show[c1, c2]
```



▼ Proposatutako Ariketa P-4.3

Lortu elipseen ondoko familia:

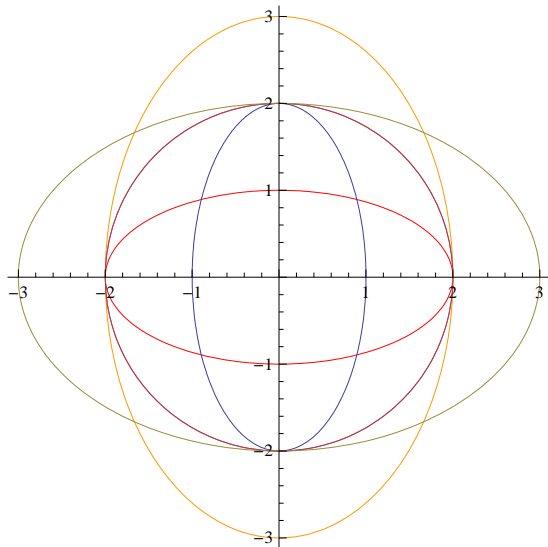


▼ Soluzioa P-4.3

```

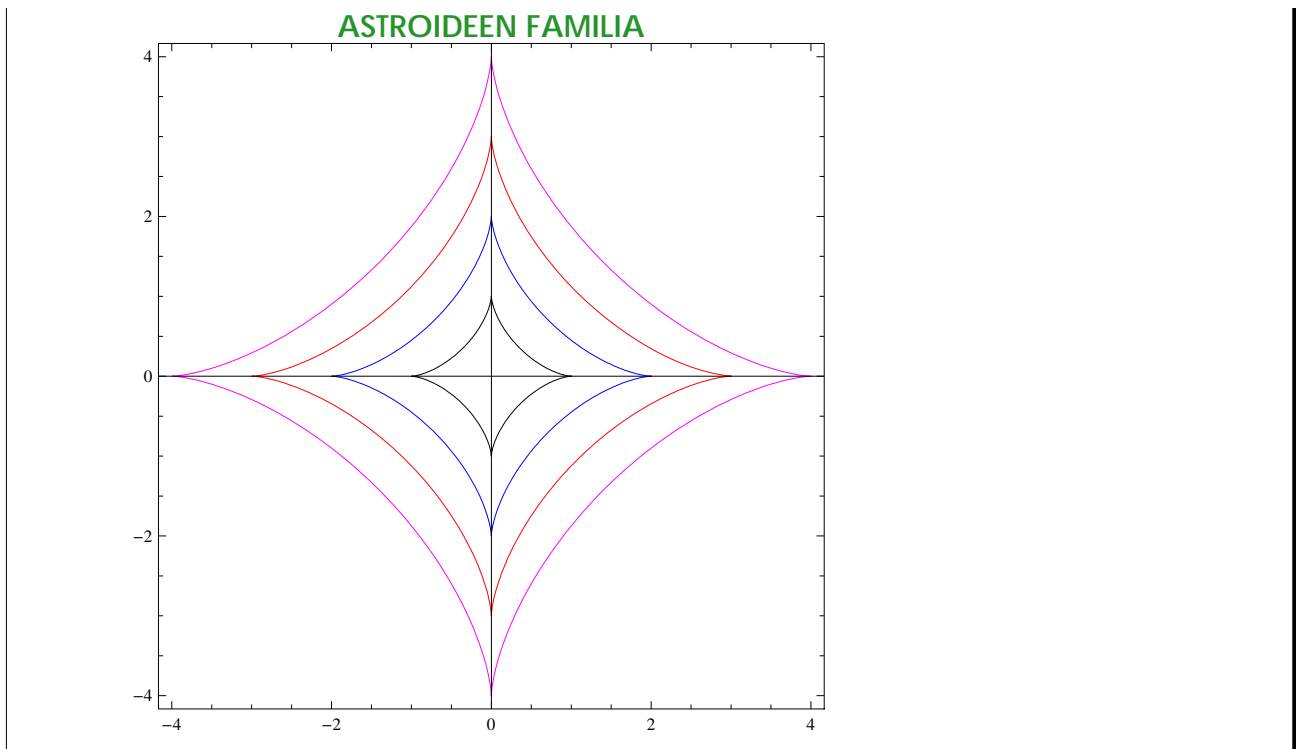
ellipse[t_, a_, b_, c_, d_] = {a * Sin[t], b * Cos[t]} + {c, d};
g1 = ParametricPlot[Evaluate[Table[ellipse[t, 2, i, 0, 0], {i, 1, 3}]], {t, 0, 2 Pi},
  PlotStyle -> Table[RGBColor[1, i * 0.3, 0], {i, 0, 2}], AspectRatio -> Automatic];
g2 = ParametricPlot[Evaluate[Table[ellipse[t, i, 2, 0, 0], {i, 1, 3}]],
  {t, 0, 2 Pi}, PlotStyle -> PlotStyle -> Table[RGBColor[0, 1, i * 0.3], {i, 0, 2}],
  AspectRatio -> Automatic];
Show[g1, g2, PlotRange -> {-3, 3}]

```



▼ Proposatutako Ariketa P-4.4

Lortu astroideen ondoko familia:



▼ Soluzioa P-4.4

```
Clear[a]
```

```
astroide[t_, a_] = {a * Cos[t]^3, a * Sin[t]^3};
```

```
Table[astroide[t, i], {i, 4}]
```

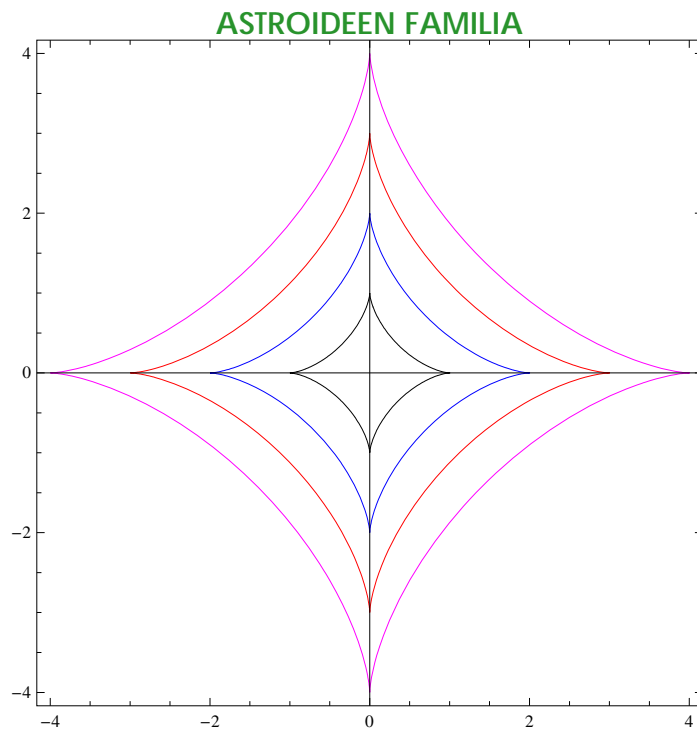
```
{{Cos[t]^3, Sin[t]^3}, {2 Cos[t]^3, 2 Sin[t]^3}, {3 Cos[t]^3, 3 Sin[t]^3}, {4 Cos[t]^3, 4 Sin[t]^3}}
```

```
{{Cos[t]^3, Sin[t]^3}, {2 Cos[t]^3, 2 Sin[t]^3}, {3 Cos[t]^3, 3 Sin[t]^3}, {4 Cos[t]^3, 4 Sin[t]^3}}
```

```

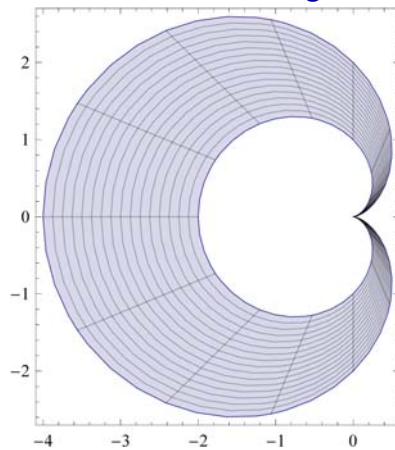
ParametricPlot[{{Cos[t]^3, Sin[t]^3}, {2 Cos[t]^3, 2 Sin[t]^3},
  {3 Cos[t]^3, 3 Sin[t]^3}, {4 Cos[t]^3, 4 Sin[t]^3}}, {t, 0, 2 π}, AspectRatio → Automatic,
  PlotStyle → Flatten[Table[RGBColor[a, 0, c], {a, 0, 1}, {c, 0, 1}]],
  PlotLabel → Style["ASTROIDEEN FAMILIA", Bold, 14], Frame → True]

```



▼ Proposatutako Ariketa P-4.5

Irudikatu kordioideen artean dagoen eremua:



▼ Soluzioa P-4.5

```
ParametricPlot[{r * (1 - Cos[t]) * Cos[t], r * (1 - Cos[t]) * Sin[t]},  
{t, 0, 2 Pi}, {r, 1, 2}, Axes → False]
```

