# P3

# 3. PRAKTIKA: KURBEN ADIERAZPENA FORMA INPLIZITUAN

## ▼ Proposatutako Ariketa P-3.1

**Ondorengo kurba familia emanik:**

$1=5x^2+4y^2$; $0=15-7x^2-5y^2$

a) Irudikatu funtzioak ardatz berdinak erabilita.

b) Grafiko bakoitza kolore ezberdin bat erabilita marraztu.

c) Funtzio bakoitzari etiketa ezberdin bat jarri.

d) Irudiaren inguruko laukia kendu eta ardatzak jarri.

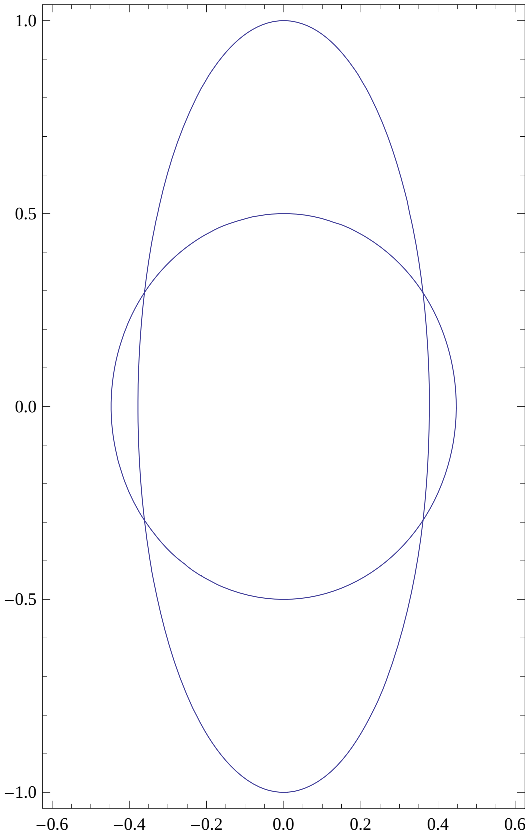
## ▼ Soluzioa P-3.1

★ a) Funtzioak definituko ditugu eta ardatz berdinak erabilita adieraziko ditugu

```
f1[x_, y_] = 5 x^2 + 4 y^2 - 1; f2[x_, y_] = 1 - 7 x^2 - y^2;
```

```
g1 = ContourPlot[f1[x, y] == 0, {x, -0.6, 0.6}, {y, -1, 1}];
g2 = ContourPlot[f2[x, y] == 0, {x, -0.6, 0.6}, {y, -1, 1}];
```

```
Show[{g1, g2}, AspectRatio → Automatic]
```




★ **b)** **Funtzio bakoitzari kolore ezberdin bat emango diogu**

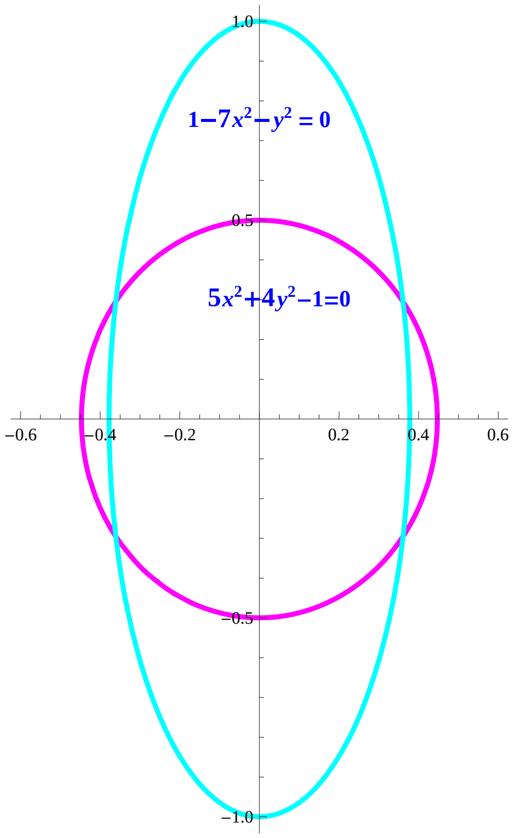
```
g1 = ContourPlot[f1[x, y] == 0, {x, -0.6, 0.6},
   {y, -1, 1}, ContourStyle → {Thickness[0.01], Magenta}];
g2 = ContourPlot[f2[x, y] == 0, {x, -0.6, 0.6}, {y, -1, 1},
   ContourStyle → {Thickness[0.01], Cyan}];

Show[{g1, g2}, AspectRatio → Automatic];
```

★ **c)** **Etiketak jarriko ditugu**

```
Show[{g1, g2}, AspectRatio → Automatic,
  Epilog → {Text[Style["5x²+4y²-1=0", Medium, Bold, Blue], {0.05, 0.3}],
    Text[Style["1-7x²-y² = 0", Medium, Bold, Blue], {0.0, .75}]}];
```

★ **d) Inguruko laukia kendu eta ardatzak erantsiko ditugu**

```
Show[{g1, g2}, AspectRatio → Automatic, Axes → True, Frame → False,
 Epilog → {Text[Style["5x²+4y²-1=0", Medium, Bold, Blue], {0.05, 0.3}],
   Text[Style["1-7x²-y² = 0", Medium, Bold, Blue], {0.0, .75}]}]
```




## ▼ Proposatutako Ariketa P-3.2

**a) Definitu f(x,y) = sin(x)sin(y) - 0,5 eta g(x,y) = cos(x)cos(y) - 0,5 funtzioak.**
**b) Egin f(x,y) funtzioaren adierazpen grafikoa eta baita ere f(x,y) = 0 eta g(x,y) = 0-rena ere, ardatz berdinak erabilita, bakoitzari kolore ezberdinak egokituta eta grafikoaren atzealdeari ere kolore bat egokituta.**

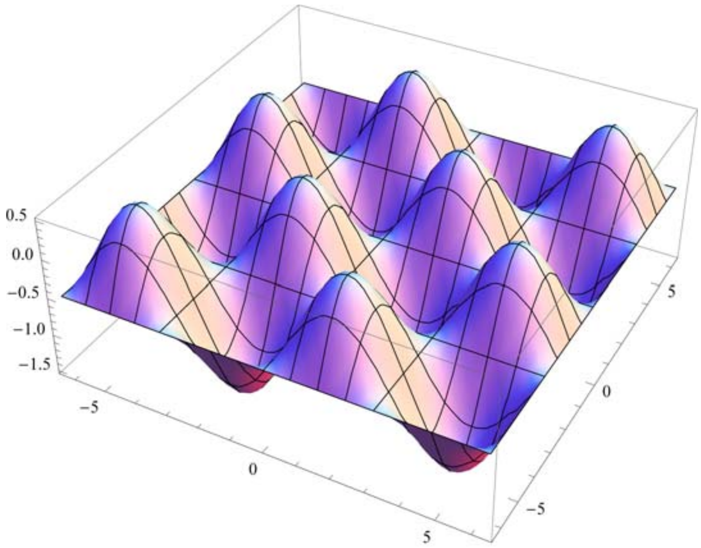
## ▼ Soluzioa P-3.2

★ **a) Funtzioen definizioa**

```
f[x_, y_] = Sin[x] * Sin[y] - 0.5;
g[x_, y_] = Cos[x] * Cos[y] - 0.5;
```

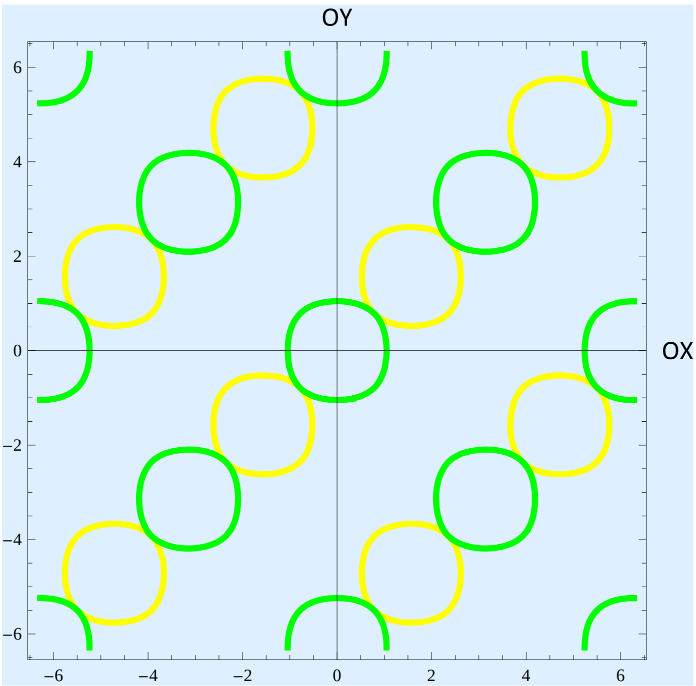
### ⋆ b) f(x,y) funtzioaren adierazpen grafikoa

```
Plot3D[{f[x, y]}, {x, -2 π, 2 π}, {y, -2 π, 2 π}]
```

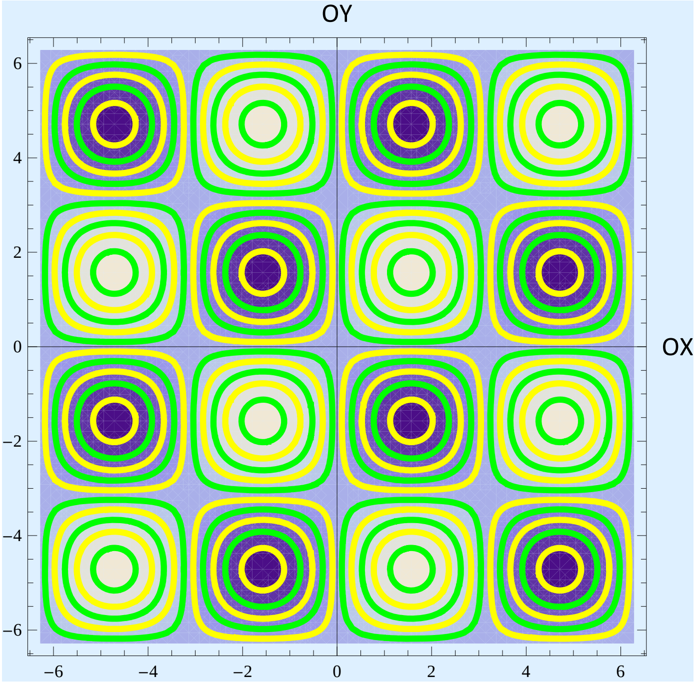



### ⋆ b) f(x,y)=0 eta g(x,y)=0-ren adierazpen grafikoa

```
ContourPlot[{f[x, y] == 0, g[x, y] == 0}, {x, -2 π, 2 π}, {y, -2 π, 2 π},
 ContourStyle → {{Thickness[0.01], Yellow}, {Thickness[0.01], Green}},
 Axes → True, AxesLabel → {"OX", "OY"}, Background → LightBlue]
```

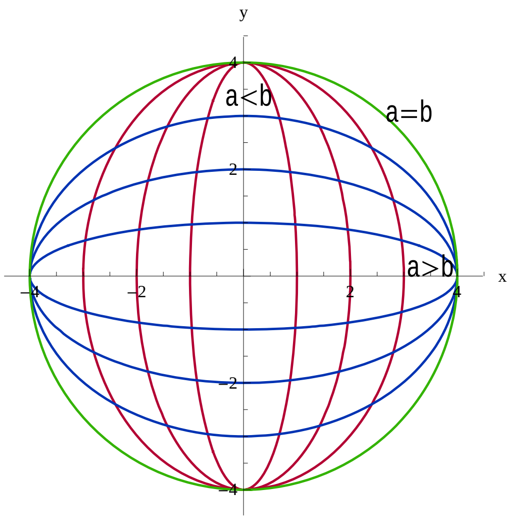


```
ContourPlot[{f[x, y]}, {x, -2 π, 2 π}, {y, -2 π, 2 π},
 ContourStyle → {{Thickness[0.01], Yellow}, {Thickness[0.01], Green}},
 Axes → True, AxesLabel → {"OX", "OY"}, Background → LightBlue]
```




## ▾ Proposatutako Ariketa P-3.3

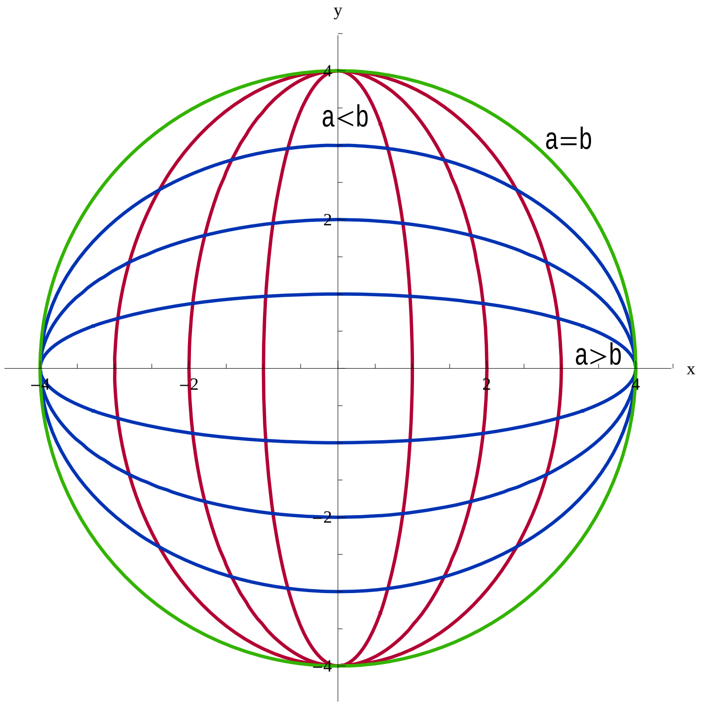
**Marraztu ondorengo elipse familia:**




## ▾ Soluzioa P-3.3

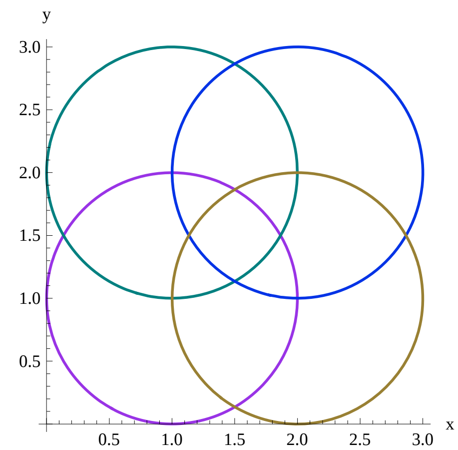
```
a = ContourPlot[{y^2 / 16 + x^2 / 1 == 1, y^2 / 16 + x^2 / 4 == 1, y^2 / 16 + x^2 / 9 == 1},
   {x, -4, 4}, {y, -4, 4}, Frame → False, Axes → True, AxesLabel → {"x", "y"},
   ContourStyle → {{RGBColor[0.7, 0, 0.2], Thickness[0.005]},
     {RGBColor[0.7, 0, 0.2], Thickness[0.005]}, {RGBColor[0.7, 0, 0.2],
      Thickness[0.005]}, {RGBColor[0.7, 0, 0.2`], Thickness[0.005]}}];
```

```
b = ContourPlot[{x^2 / 16 + y^2 / 1 == 1, x^2 / 16 + y^2 / 4 == 1, x^2 / 16 + y^2 / 9 == 1},
   {x, -4, 4}, {y, -4, 4}, Frame → False, Axes → True, AxesLabel → {"x", "y"},
   ContourStyle → {{RGBColor[0, 0.2, 0.7], Thickness[0.005]}, {RGBColor[0, 0.2, 0.7],
      Thickness[0.005]}, {RGBColor[0, 0.2, 0.7], Thickness[0.005]}}];
c = ContourPlot[{x^2 + y^2 == 16}, {x, -4, 4}, {y, -4, 4}, Frame → False, Axes → True,
   AxesLabel → {"x", "y"}, ContourStyle → {{RGBColor[0.2, 0.7, 0], Thickness[0.005]}}];
etiketak = {Text["a=b", {3.1, 3.1}], Text["a>b", {3.5, 0.2}], Text["a<b", {0.1, 3.4}]};
Show[a, b, c, PlotRange → {{-4.3, 4.3}, {-4.3, 4.3}}, Epilog → Graphics[etiketak][[1]]]
```



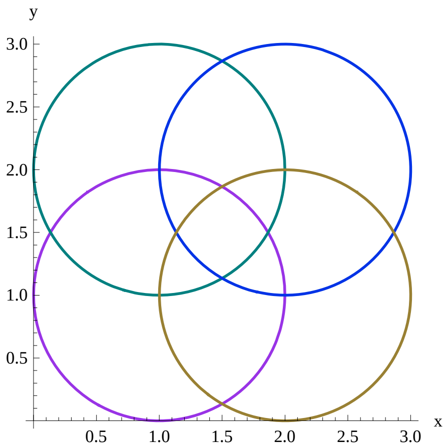

## ▾ Proposatutako Ariketa P-3.4

**Irudikatu ondorengo zirkunferentzia familia:**



## ▼ Soluzioa P-3.4

```
a = ContourPlot[
  {(x - 1)^2 + (y - 1)^2 == 1, (x - 1)^2 + (y - 2)^2 == 1, (x - 2)^2 + (y - 2)^2 == 1, (x - 2)^2 + (y - 1)^2 == 1},
  {x, 0, 3}, {y, 0, 3}, ContourStyle → {{RGBColor[0.6, 0.2, 0.9], Thickness[0.007]},
    {RGBColor[0, 0.5, 0.5], Thickness[0.007]}, {RGBColor[0, 0.2, 0.9],
     Thickness[0.007]}, {RGBColor[0.6, 0.5, 0.2], Thickness[0.007]}},
  Axes → True, AxesLabel → {"x", "y"}, Frame → False]
```




## ▼ Proposatutako Ariketa P-3.5

**Ardatz berdinak erabilita irudikatu:**

$x^2+y^2=1$; $x^2+y^2=4$ **eta** $x^2+y^2=9$

**bakoitza kolore ezberdin bat erabilita. Grafikoari "zirkunferentziak" izena jarri, inguruko laukia kendu, ardatzak gehitu eta izenak jarri.**

## ▼ Solución P-3.5

```
a = ContourPlot[{x^2 + y^2 == 1, x^2 + y^2 == 4, x^2 + y^2 == 9},
  {x, -3, 3}, {y, -3, 3}, ContourStyle →
   {{Thickness[0.01], Blue}, {Thickness[0.01], Green}, {Thickness[0.01], Orange}},
  Axes → True, Frame → False, AxesLabel → {"OX", "OY"}, PlotLabel → Style[
    Framed["ZIRKUNFERENTZIAK"], 16, Blue, Background → Lighter[LightYellow]]]
```