```
k = (c.{{x^2, x y / 2}, {x y / 2, y^2}}.Transpose[c]) 2 / 100 /. α → ArcCos[b]
```

$$\left\{\left\{\frac{1}{50}\left(b\left(b\,x^2-\frac{1}{2}\sqrt{1-b^2}\;x\,y\right)-\sqrt{1-b^2}\;\left(\frac{b\,x\,y}{2}-\sqrt{1-b^2}\;y^2\right)\right),\right.\right.$$
$$\left.\frac{1}{50}\left(\sqrt{1-b^2}\;\left(b\,x^2-\frac{1}{2}\sqrt{1-b^2}\;x\,y\right)+b\left(\frac{b\,x\,y}{2}-\sqrt{1-b^2}\;y^2\right)\right)\right\},$$
$$\left\{\frac{1}{50}\left(b\left(\sqrt{1-b^2}\;x^2+\frac{b\,x\,y}{2}\right)-\sqrt{1-b^2}\;\left(\frac{1}{2}\sqrt{1-b^2}\;x\,y+b\,y^2\right)\right),\right.$$
$$\left.\left.\frac{1}{50}\left(\sqrt{1-b^2}\;\left(\sqrt{1-b^2}\;x^2+\frac{b\,x\,y}{2}\right)+b\left(\frac{1}{2}\sqrt{1-b^2}\;x\,y+b\,y^2\right)\right)\right\}\right\}$$

```
ko1 = Simplify[-k[[1, 2]]]
```

$$\frac{1}{100}\left(x\,y-2\,b^2\,x\,y+2\,b\sqrt{1-b^2}\;\left(-x^2+y^2\right)\right)$$

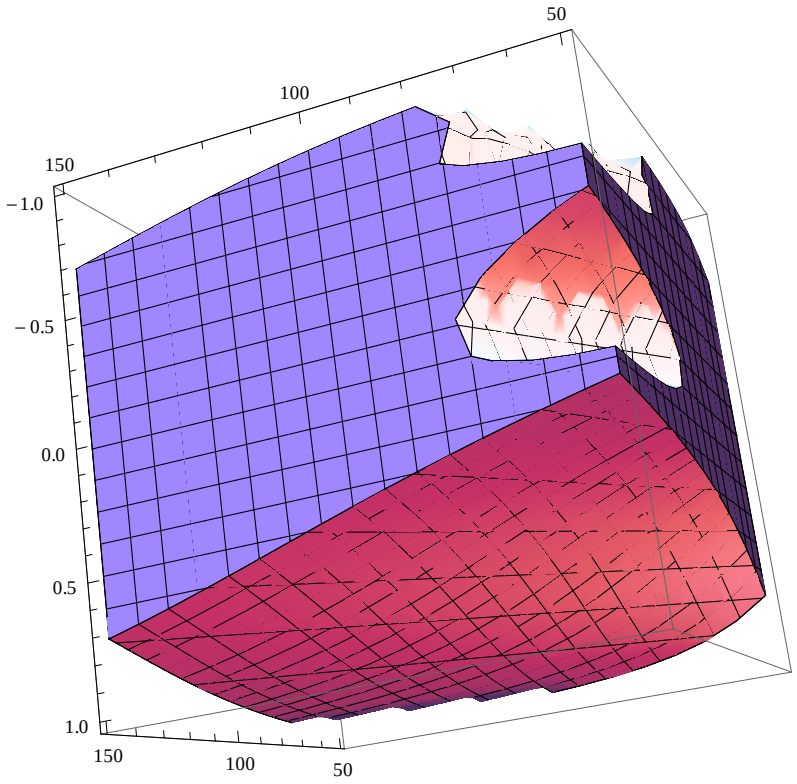
```
ko = Simplify[k[[1, 1]] + k[[1, 2]]]
```

$$\frac{1}{100}\left(y\,(-x+2\,y)+2\,b\sqrt{1-b^2}\;\left(x^2-x\,y-y^2\right)+2\,b^2\left(x^2+x\,y-y^2\right)\right)$$

```
ko2 = Simplify[k[[2, 2]] + k[[1, 2]]]
```

$$\frac{1}{100}\left(2\left(1-b^2+b\sqrt{1-b^2}\right)x^2+\left(-1+2\,b^2+2\,b\sqrt{1-b^2}\right)x\,y+2\,b\left(b-\sqrt{1-b^2}\right)y^2\right)$$

```
RegionPlot3D[ko2 ≥ 0 && ko ≥ 0 && ko1 ≥ 0, {x, 50, 150}, {y, 50, 150}, {b, -1, 1}]
```



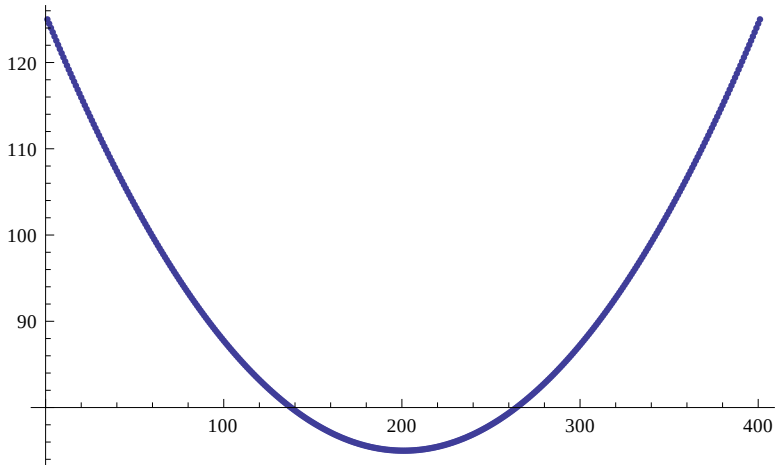

```
f[a_] := MinValue[{ko + ko2 + ko1 /. b → a, 50 ≤ x ≤ 150, 50 ≤ y ≤ 150}, {x, y}];
```

```
f3[a_] := Min[f[a], f2[a], f1[a]]
```

```
f3[0.5]
```

```
-135.705
```

```
ListPlot[Table[f[i / 200], {i, -200, 200}]]
```




```
bb = 1; {f[bb], f1[bb], f2[bb]}
```

$$\left\{\frac{25}{2}, 25, \frac{25}{2}\right\}$$

```
Simplify[k /. α → π 37 / 60 // N]
```

$$\{\{0.00256855\, x^2 + 0.00669131\, x\, y + 0.0174314\, y^2,\ -0.00669131\, x^2 - 0.00743145\, x\, y + 0.00669131\, y^2\},\ \{-0.00669131\, x^2 - 0.00743145\, x\, y + 0.00669131\, y^2,\ 0.0174314\, x^2 - 0.00669131\, x\, y + 0.00256855\, y^2\}\}$$

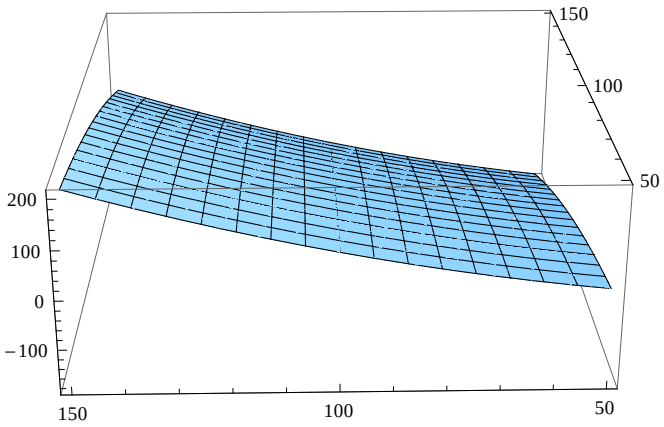
```
π 37 / 60.
```

```
1.93732
```

```
(k /. α -> ArcCos[-0.7614944037382076`])[[1, 2]] /. x → 150 /. y -> 50
```

```
-185.451
```

```
Plot3D[%, {x, 50, 150}, {y, 50, 150}]
```




```
{d, b} = GenDandB[sys];
```

```
d // MatrixForm
```

$$\begin{pmatrix} \frac{5}{32} & -\frac{5}{32} & 0 & 0 & \frac{5}{32} & -\frac{5}{32} \\ 0 & 0 & \frac{5}{32} & -\frac{5}{32} & \frac{5}{32} & -\frac{5}{32} \\ \frac{25}{2048} & \frac{25}{2048} & 0 & 0 & \frac{25}{2048} & \frac{25}{2048} \\ 0 & 0 & 0 & 0 & \frac{25}{1024} & \frac{25}{1024} \\ 0 & 0 & \frac{25}{2048} & \frac{25}{2048} & \frac{25}{2048} & \frac{25}{2048} \\ \frac{125}{196\,608} & -\frac{125}{196\,608} & 0 & 0 & \frac{125}{196\,608} & -\frac{125}{196\,608} \\ 0 & 0 & 0 & 0 & \frac{125}{65\,536} & -\frac{125}{65\,536} \\ 0 & 0 & 0 & 0 & \frac{125}{65\,536} & -\frac{125}{65\,536} \\ 0 & 0 & \frac{125}{196\,608} & -\frac{125}{196\,608} & \frac{125}{196\,608} & -\frac{125}{196\,608} \end{pmatrix}$$

```
t[n_] := {Sum[Binomial[i + n - 1, n - 1], {i, 2}], 2^n}
```

```
t[]
```

```
{5, 4}
```