

# Les calculs pour les solutions des exercices de VII.2

February 9, 2017

## 1 Calculs pour les solutions des exercices de la section VII.2

### 1.1 Exercice 1

Les quelles sont à centre, les cas échéant donner le centre.

```
var('x,y')
def Fun(a,b,c,d,e,f):
    A=matrix([[a,b/2],[b/2,c]])
    A1 = matrix([[a,b/2,d/2],[b/2,c,e/2],[d/2,e/2,f]])
    genre = A.determinant()
    show("L'équation : ", a*x^2 +b*x*y + c*y^2 + d*x +e*y + f)
    show("Le genre : ", genre)
    if genre != 0 :
        show("Le centre est: ", A.solve_right(vector([-d,-e])))
    else :
        show("pas a centre")
```

(x, y)

```
#a
Fun(2,4,-3,12,-3,7)
#b
Fun(2,5,4,9,-1,-12)
#c
Fun(1,-4,4,8,-6,13)
#d
Fun(1,-4,4,6,-12,-11)
#e
Fun(4,-2,1,-7,5,12)
#f
Fun(11,-2,1,6,-6,-3)
# g
```

Fun(25, -20, 4, 2, -14, -15)

# h

Fun(9, -6, -4, -7, 3, 12)

L'équation :  $2x^2 + 4xy - 3y^2 + 12x - 3y + 7$

Le genre : -10

Le centre est: (-3, -3)

L'équation :  $2x^2 + 5xy + 4y^2 + 9x - y - 12$

Le genre :  $\frac{7}{4}$

Le centre est: (-22, 14)

L'équation :  $x^2 - 4xy + 4y^2 + 8x - 6y + 13$

Le genre : 0

pas a centre

L'équation :  $x^2 - 4xy + 4y^2 + 6x - 12y - 11$

Le genre : 0

pas a centre

L'équation :  $4x^2 - 2xy + y^2 - 7x + 5y + 12$

Le genre : 3

Le centre est:  $\left(\frac{2}{3}, -\frac{13}{3}\right)$

L'équation :  $11x^2 - 2xy + y^2 + 6x - 6y - 3$

Le genre : 10

Le centre est: (0, 6)

L'équation :  $25x^2 - 20xy + 4y^2 + 2x - 14y - 15$

Le genre : 0

pas a centre

L'équation :  $9x^2 - 6xy - 4y^2 - 7x + 3y + 12$

Le genre : -45

Le centre est:  $\left(\frac{37}{45}, \frac{2}{15}\right)$

## 1.2 Exercice VII.2.2

Prouver que les coniques sont à centre, translater à l'origine.

#a

Fun(2, -6, 3, 2, -4, 1)

#b

Fun(1, 4, 6, -2, 4, 2)

#c

Fun(1, 6, 4, 0, -10, -10)

#d

Fun(6, 2, 4, -10, 6, 9)

#e

Fun(1, 5, 3, -11, -8, -7)

#f

Fun(2, 4, 5, 20, 20, -18)

#g

Fun(7, 4, -9, 0, 0, 12)

#h

Fun(5, -6, 2, -16, 22, 11)

L'équation :  $2x^2 - 6xy + 3y^2 + 2x - 4y + 1$

Le genre : -3

Le centre est:  $\left(-2, -\frac{2}{3}\right)$

L'équation :  $x^2 + 4xy + 6y^2 - 2x + 4y + 2$

Le genre : 2

Le centre est: (10, -4)

L'équation :  $x^2 + 6xy + 4y^2 - 10y - 10$

Le genre : -5

Le centre est: (6, -2)

L'équation :  $6x^2 + 2xy + 4y^2 - 10x + 6y + 9$

Le genre : 23

Le centre est: (2, -2)

L'équation :  $x^2 + 5xy + 3y^2 - 11x - 8y - 7$

Le genre :  $-\frac{13}{4}$

Le centre est: (-4, 6)

L'équation :  $2x^2 + 4xy + 5y^2 + 20x + 20y - 18$

Le genre : 6

Le centre est: (-10, 0)

L'équation :  $7x^2 + 4xy - 9y^2 + 12$

Le genre : -67

Le centre est: (0, 0)

L'équation :  $5x^2 - 6xy + 2y^2 - 16x + 22y + 11$

Le genre : 1

Le centre est: (-34, -62)

### 1.3 Exercice VII.2.3

Prouver que les coniques sont à centre et en ont une infinité. Décrire le lieu

(x, y)

#a

Fun(9, -6, 1, 36, -12, 20)

#b

Fun(1, 4, 4, -4, -8, -21)

#c

Fun(1, -10, 25, -8, 40, 7)

### 1.4 Exercice VII.2.8

Déterminer le genre de chacune des courbes suivantes, la réduire à sa forme standard et étudier la

courbe qu'elle définit. Ce qu'on obtient sont les invariants de chaque courbe, ainsi que la forme sans terme en  $xy$ .

### 1.5 Exercice VII.2.8

Déterminer le genre de chacune des courbes suivantes, la réduire à sa forme standard et étudier la courbe qu'elle définit. Ce qu'on obtient sont les invariants de chaque courbe, ainsi que la forme sans terme en  $xy$ .

```

if i == 1:
    print 'i equals 1'
else:
    print 'i is not 1'

var('x,y,X,Y')
typeset_mode(True)
def Simp(a,b,c,d,e,f):
    A=matrix(SR,[[a,b/2],[b/2,c]])
    genre = A.determinant()
    gamma = A.trace()
    show("Genre :", genre)
    show("Gamma :", gamma)
    A1 = matrix(SR,[[a,b/2,d/2],[b/2,c,e/2],[d/2,e/2,f]])
    Delta = A1.determinant()
    show("Delta :", Delta)
    k=vector([d/2,e/2])
    show(a*x^2 +b*x*y + c*y^2 + d*x + e*y + f)
    #show(A)
    #show(k)
    Paire = A.jordan_form(transformation = True)
    D = Paire[0]
    P = Paire[1].change_ring(SR)
    P= P.with_rescaled_col(0,1/P.column(0).norm())
    P= P.with_rescaled_col(1,1/P.column(1).norm())
    V = vector([X,Y])
    show((V*D*V + 2*k*P*V+f))
    Courbe = implicit_plot(a*x^2 +b*x*y + c*y^2 + d*x + e*y + f \
==0, (x,-10,10), (y,-10,10), color='blue')
    show(Courbe, figsize = 4, axes=True)
(x, y, X, Y)

```

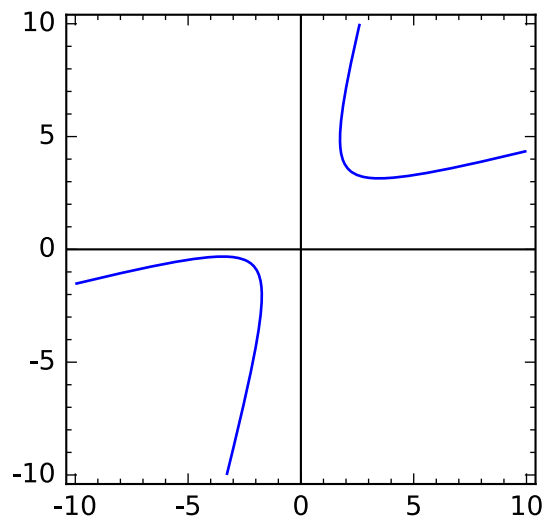
```
Simp(1, -4,1,4*sqrt(2),-2*sqrt(2),11)
```

Genre : -3

Gamma : 2

Delta : -27

$x^2 - 4xy + y^2 + 4\sqrt{2}x - 2\sqrt{2}y + 11$



$$3X^2 - Y^2 + 6X + 2Y + 11$$

#a

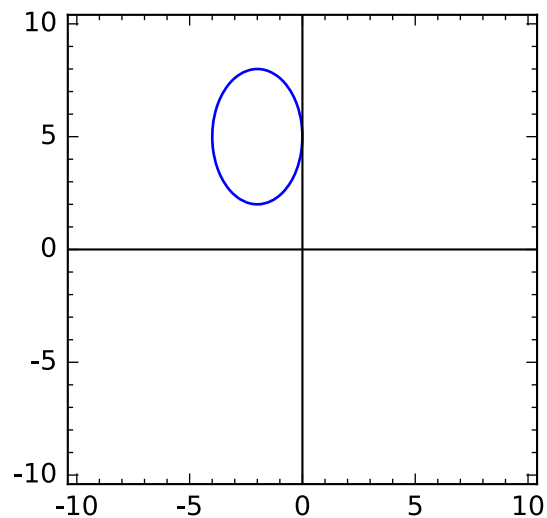
Simp(9, 0, 4, 36, -40, 100)

Genre : 36

Gamma : 13

Delta : -1296

$$9x^2 + 4y^2 + 36x - 40y + 100$$



$$4X^2 + 9Y^2 - 40X + 36Y + 100$$

#b

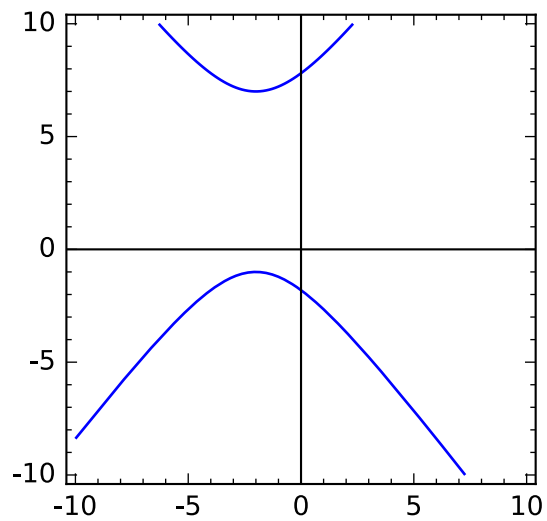
Simp(16, 0, -9, 64, 54, 127)

Genre : -144

Gamma : 7

Delta : -20736

$$16x^2 - 9y^2 + 64x + 54y + 127$$



$$-9X^2 + 16Y^2 + 54X + 64Y + 127$$

#c

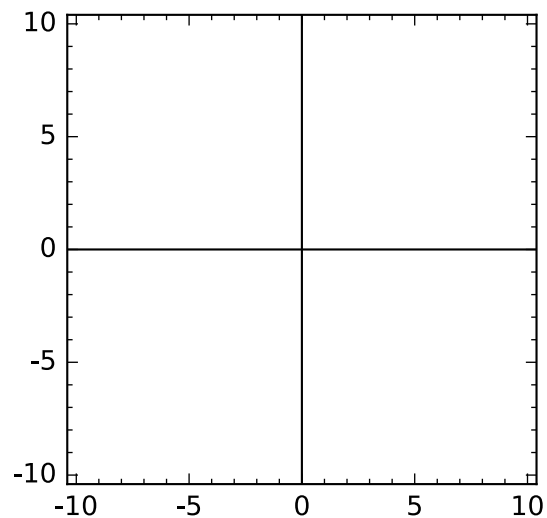
Simp(4, 0, 9, -8, 18, 49)

Genre : 36

Gamma : 13

Delta : 1296

$$4x^2 + 9y^2 - 8x + 18y + 49$$



$$4X^2 + 9Y^2 - 8X + 18Y + 49$$

#d

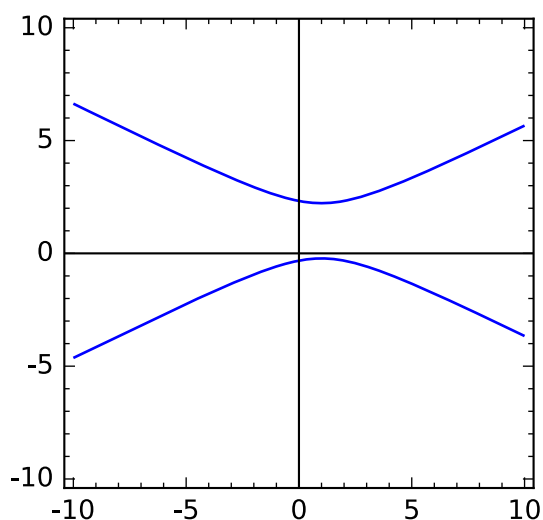
Simp(1, 0, -4, -2, 8, 3)

Genre : -4

Gamma : -3

Delta : -24

$$x^2 - 4y^2 - 2x + 8y + 3$$



$$-4X^2 + Y^2 + 8X - 2Y + 3$$

#e

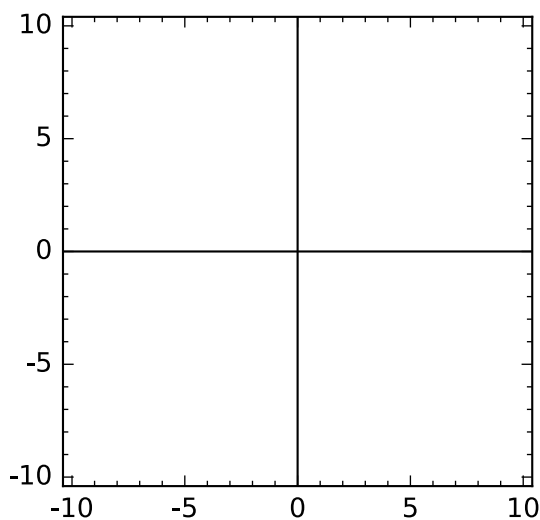
Simp (3, 0, 2, -6, 8, 11)

Genre : 6

Gamma : 5

Delta : 0

$$3x^2 + 2y^2 - 6x + 8y + 11$$



$$2X^2 + 3Y^2 + 8X - 6Y + 11$$

#i

Simp (-5, 1, 0, 48, 0, -36)

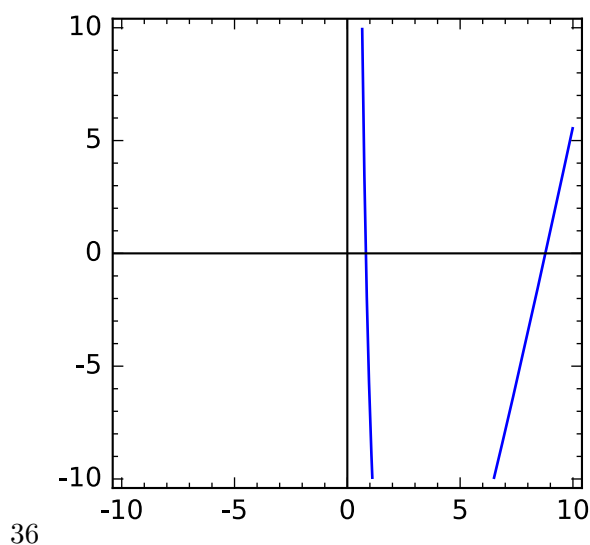
Genre :  $-\frac{1}{4}$

Gamma : -5

Delta : 9

$$-5x^2 + xy + 48x - 36$$

$$-\frac{1}{2}X^2(\sqrt{26}+5) + \frac{1}{2}Y^2(\sqrt{26}-5) + \frac{48X}{\sqrt{(\sqrt{26}-5)^2+1}} + \frac{48Y}{\sqrt{(\sqrt{26}+5)^2+1}} -$$



36

#j

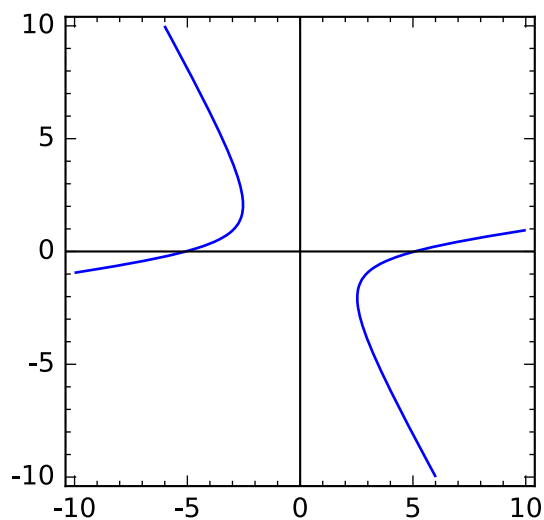
Simp (7, -52, -32, 0, 0, -180)

Genre : -900

Gamma : -25

Delta : 162000

$$7x^2 - 52xy - 32y^2 - 180$$



$$-45X^2 + 20Y^2 - 180$$

#k

Simp (5, -6, 5, 0, 0, -32)

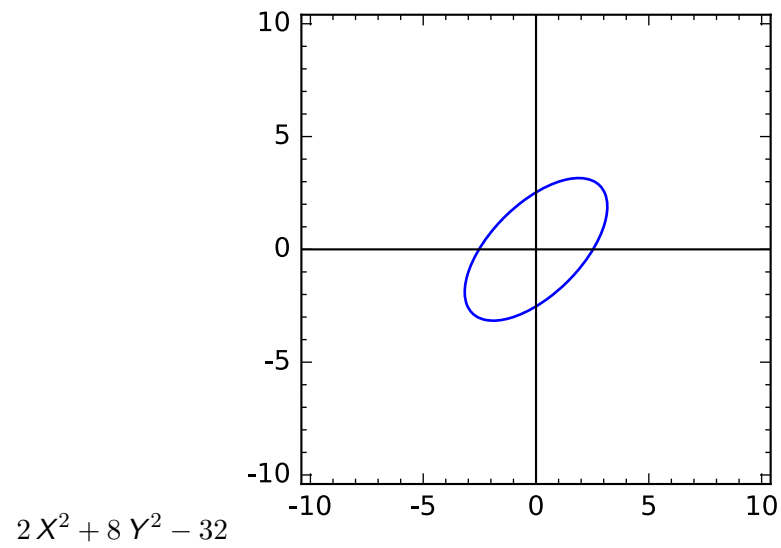
Genre : 16

Gamma : 10

Delta : -512

$$5x^2 - 6xy + 5y^2 - 32$$





#1

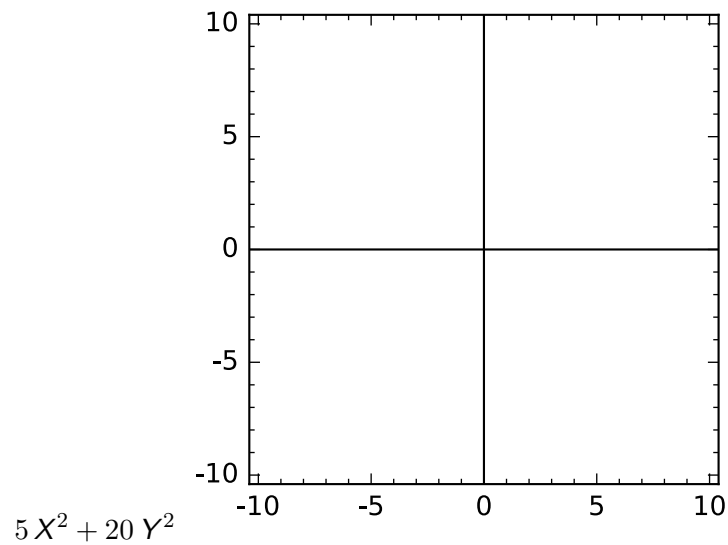
Simp(8, -12, 17, 0, 0, 0)

Genre : 100

Gamma : 25

Delta : 0

$$8x^2 - 12xy + 17y^2$$



#m

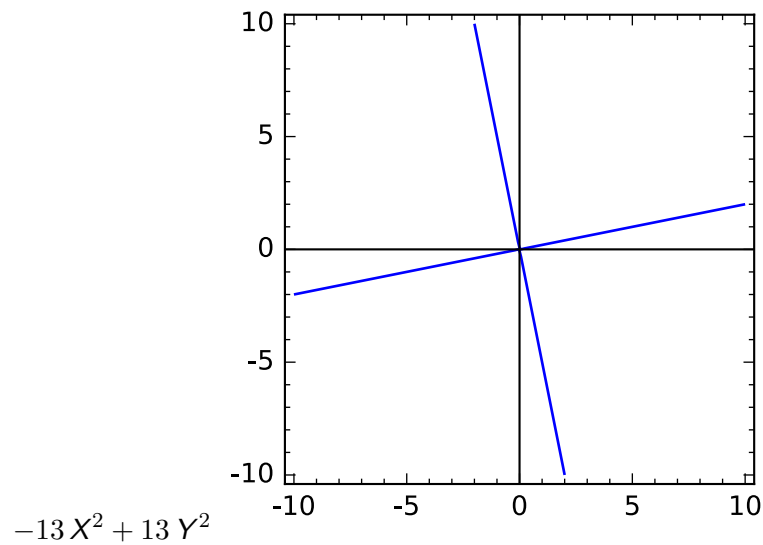
Simp(5, -24, -5, 0, 0, 0)

Genre : -169

Gamma : 0

Delta : 0

$$5x^2 - 24xy - 5y^2$$



#n

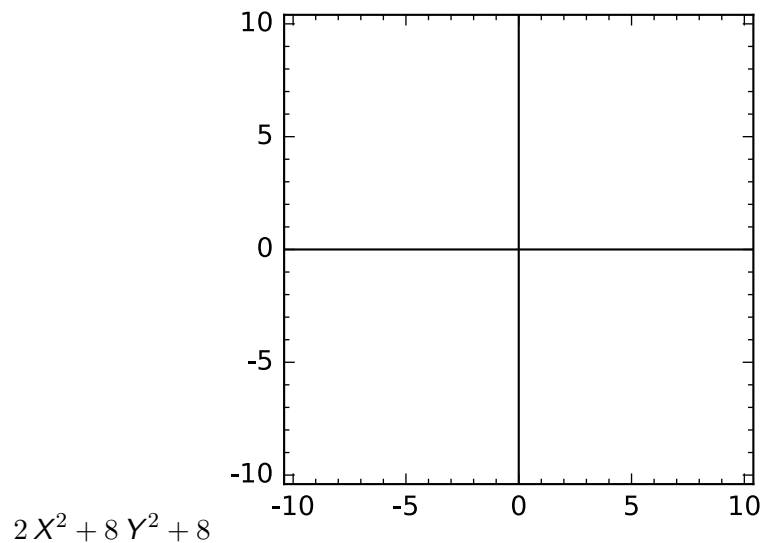
Simp (5, -6, 5, 0, 0, 8)

Genre : 16

Gamma : 10

Delta : 128

$$5x^2 - 6xy + 5y^2 + 8$$



#o

Simp (12, 10, 2, 18, -7, -15)

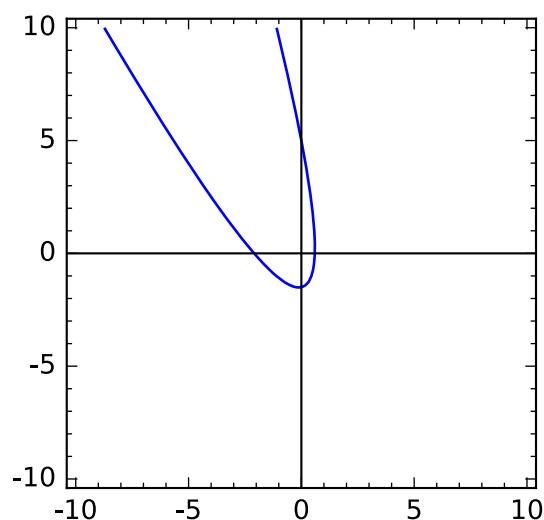
Genre : -1

Gamma : 14

Delta : -609

$$12x^2 + 10xy + 2y^2 + 18x - 7y - 15$$

$$Y^2(5\sqrt{2} + 7) - X^2(5\sqrt{2} - 7) + X \left( \frac{7(\sqrt{2} + 1)}{\sqrt{(\sqrt{2} + 1)^2 + 1}} + \frac{18}{\sqrt{(\sqrt{2} + 1)^2 + 1}} \right) -$$



$$Y \left( \frac{7(\sqrt{2}-1)}{\sqrt{(\sqrt{2}-1)^2+1}} - \frac{18}{\sqrt{(\sqrt{2}-1)^2+1}} \right) - 15$$

#p

Simp(7, -8, 3, -15, 8, 20)

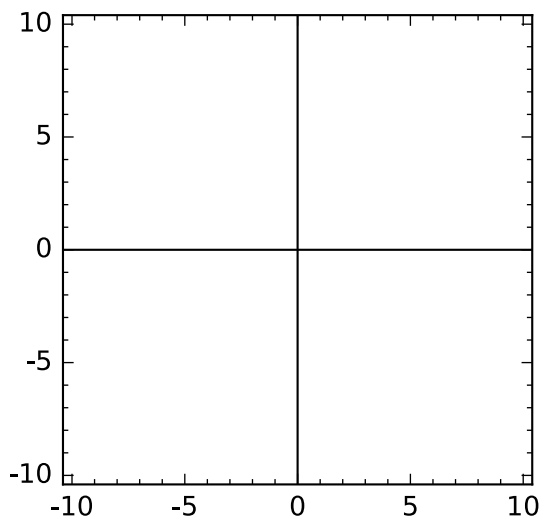
Genre : 5

Gamma : 10

Delta :  $\frac{237}{4}$

$$7x^2 - 8xy + 3y^2 - 15x + 8y + 20$$

$$Y^2(2\sqrt{5}+5) - X^2(2\sqrt{5}-5) + X \left( \frac{4(\sqrt{5}+1)}{\sqrt{\frac{1}{4}(\sqrt{5}+1)^2+1}} - \frac{15}{\sqrt{\frac{1}{4}(\sqrt{5}+1)^2+1}} \right) -$$



$$Y \left( \frac{4(\sqrt{5}-1)}{\sqrt{\frac{1}{4}(\sqrt{5}-1)^2+1}} + \frac{15}{\sqrt{\frac{1}{4}(\sqrt{5}-1)^2+1}} \right) + 20$$

#q

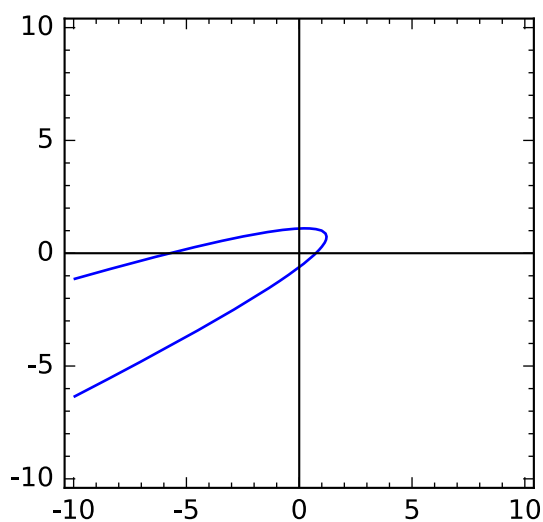
Simp(4, -20, 25, 20, -12, -17)

Genre : 0

Gamma : 29

Delta : -1444

$$4x^2 - 20xy + 25y^2 + 20x - 12y - 17$$



$$29Y^2 + \frac{76}{29}\sqrt{29}X + \frac{100}{29}\sqrt{29}Y - 17$$

#r

Simp(11, 14, 5, -7, 12, 19)

Genre : 6

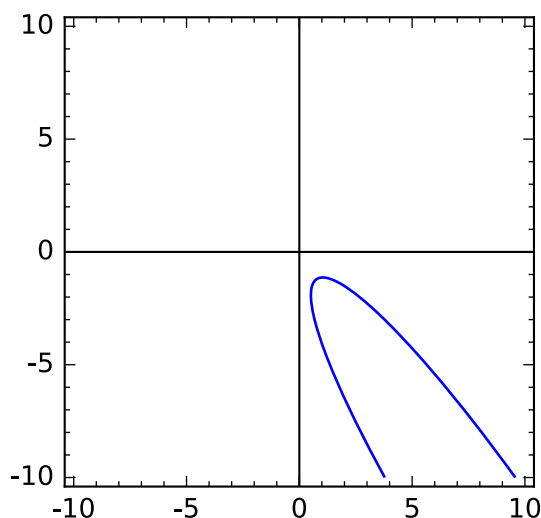
Gamma : 16

Delta :  $-\frac{2549}{4}$

$$11x^2 + 14xy + 5y^2 - 7x + 12y + 19$$

$$Y^2(\sqrt{58} + 8) - X^2(\sqrt{58} - 8) - \frac{1}{7}X \left( \frac{12(\sqrt{58} + 3)}{\sqrt{\frac{1}{49}(\sqrt{58} + 3)^2 + 1}} + \frac{49}{\sqrt{\frac{1}{49}(\sqrt{58} + 3)^2 + 1}} \right) +$$

$$\frac{1}{7}Y \left( \frac{12(\sqrt{58} - 3)}{\sqrt{\frac{1}{49}(\sqrt{58} - 3)^2 + 1}} - \frac{49}{\sqrt{\frac{1}{49}(\sqrt{58} - 3)^2 + 1}} \right) +$$



19

#s

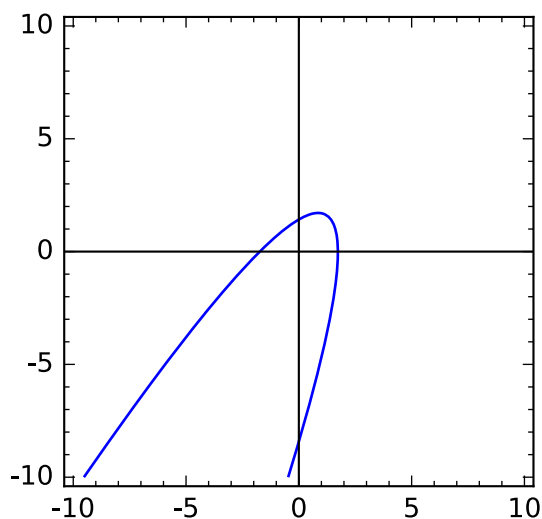
Simp(4, -4, 1, 0, 7, -12)

Genre : 0

Gamma : 5

Delta : -49

$$4x^2 - 4xy + y^2 + 7y - 12$$



$$5Y^2 + \frac{14}{5}\sqrt{5}X - \frac{7}{5}\sqrt{5}Y - 12$$

#t

Simp(3, 2, -3, -12, 0, 15)

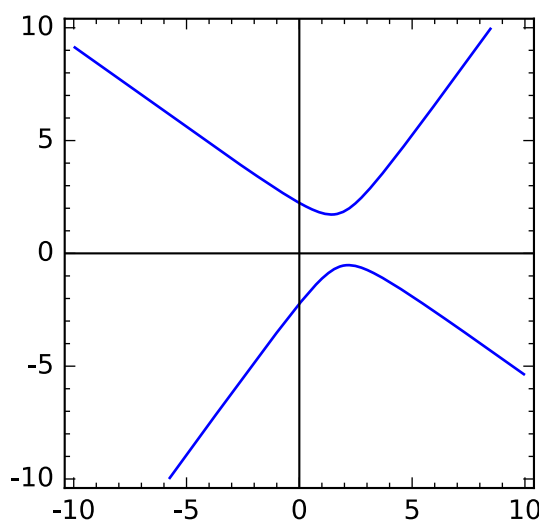
Genre : -10

Gamma : 0

Delta : -42

$$3x^2 + 2xy - 3y^2 - 12x + 15$$

$$-\sqrt{10}X^2 + \sqrt{10}Y^2 - \frac{12X}{\sqrt{(\sqrt{10}+3)^2+1}} - \frac{12Y}{\sqrt{(\sqrt{10}-3)^2+1}} +$$



15

#u

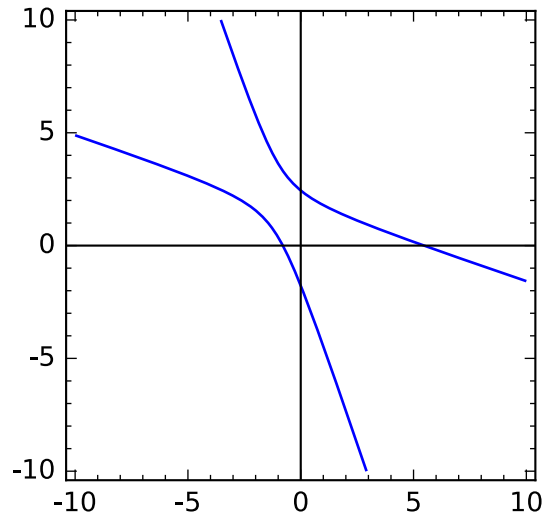
Simp(3, 10, 3, -14, -2, -13)

Genre : -16

Gamma : 6

Delta : 128

$$3x^2 + 10xy + 3y^2 - 14x - 2y - 13$$



$$-2X^2 + 8Y^2 - 6\sqrt{2}X - 8\sqrt{2}Y - 13$$

#v

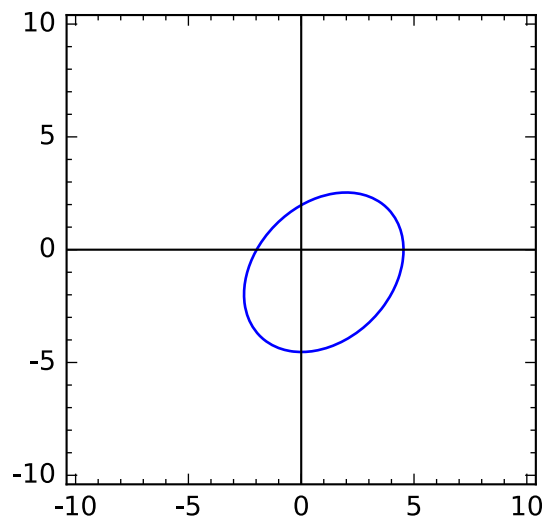
Simp(25, -14, 25, -64, 64, -224)

Genre : 576

Gamma : 50

Delta : -165888

$$25x^2 - 14xy + 25y^2 - 64x + 64y - 224$$



$$18X^2 + 32Y^2 - 64\sqrt{2}Y - 224$$

#w

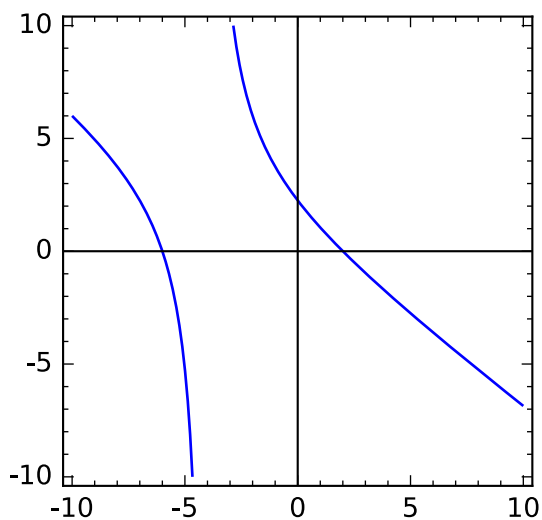
Simp(3, 4, 0, 12, 16, -36)

Genre : -4

Gamma : 3

Delta : 144

$$3x^2 + 4xy + 12x + 16y - 36$$



$$4X^2 - Y^2 + 8\sqrt{5}X - 4\sqrt{5}Y - 36$$

#x

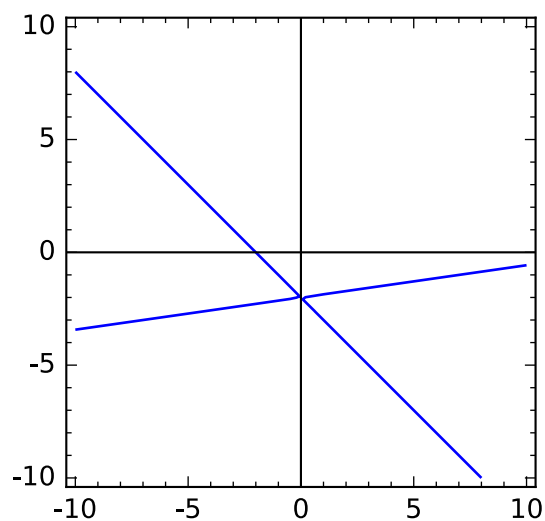
Simp(1, -6, -7, -12, -28, -28)

Genre : -16

Gamma : -6

Delta : 0

$$x^2 - 6xy - 7y^2 - 12x - 28y - 28$$



$$-8X^2 + 2Y^2 - \frac{48}{5}\sqrt{10}X - \frac{4}{5}\sqrt{10}Y - 28$$

#y

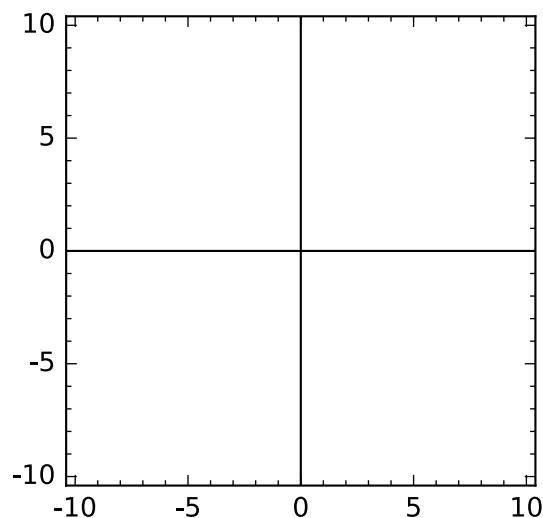
Simp(11, 6, 19, 6, 38, 29)

Genre : 200

Gamma : 30

Delta : 2000

$$11x^2 + 6xy + 19y^2 + 6x + 38y + 29$$



$$10X^2 + 20Y^2 - 2\sqrt{10}X + 12\sqrt{10}Y + 29$$

#z

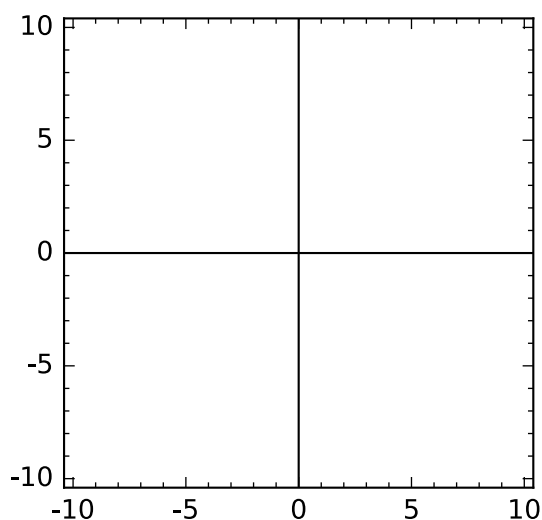
Simp(5, -2, 5, 20, -4, 20)

Genre : 24

Gamma : 10

Delta : 0

$$5x^2 - 2xy + 5y^2 + 20x - 4y + 20$$



$$6X^2 + 4Y^2 + 12\sqrt{2}X + 8\sqrt{2}Y + 20$$

#aa

Simp(21, 24, 14, 18, -4, -139)

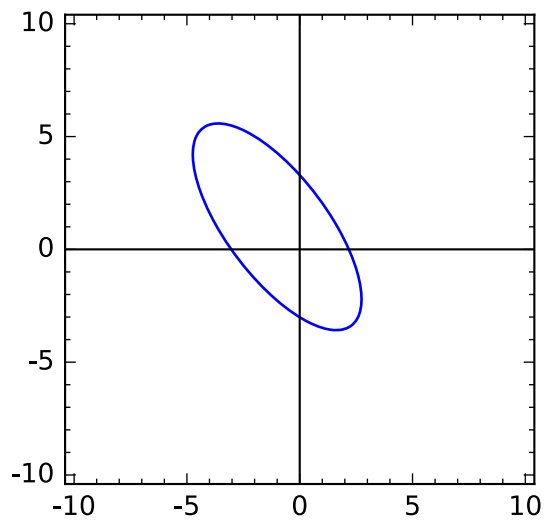
Genre : 150

Gamma : 35

Delta : -22500

$$21x^2 + 24xy + 14y^2 + 18x - 4y - 139$$





$$30X^2 + 5Y^2 + 12X + 14Y - 139$$

# ab

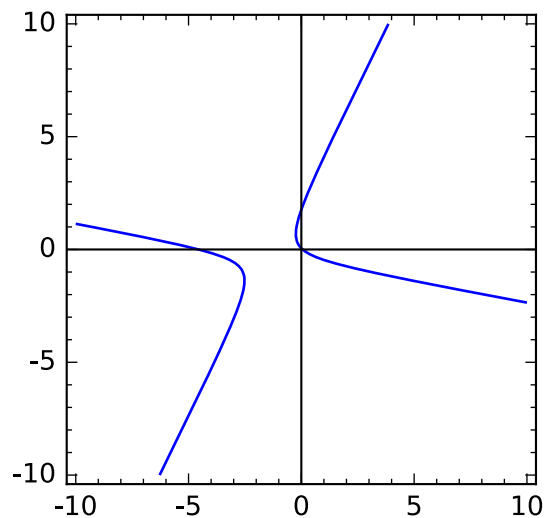
Simp(4, 20, -11, 18, 20, -1)

Genre : -144

Gamma : -7

Delta : 2435

$$4x^2 + 20xy - 11y^2 + 18x + 20y - 1$$



$$9X^2 - 16Y^2 + \frac{56}{5}\sqrt{5}X - \frac{22}{5}\sqrt{5}Y - 1$$

#ac

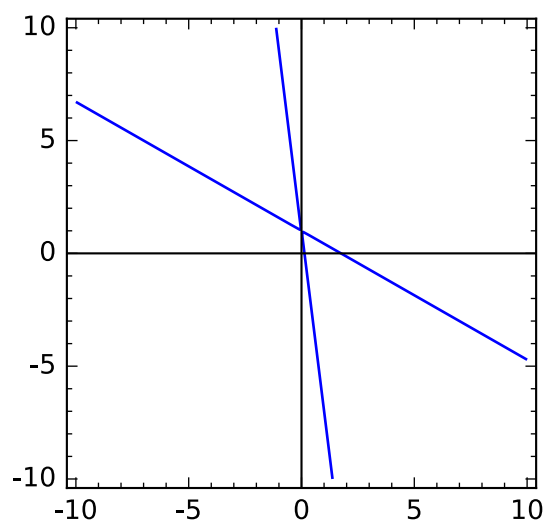
Simp(32, 60, 7, -60, -14, 7)

Genre : -676

Gamma : 39

Delta : 0

$$32x^2 + 60xy + 7y^2 - 60x - 14y + 7$$



$$52X^2 - 13Y^2 - 16\sqrt{13}X - 6\sqrt{13}Y + 7$$

#ad

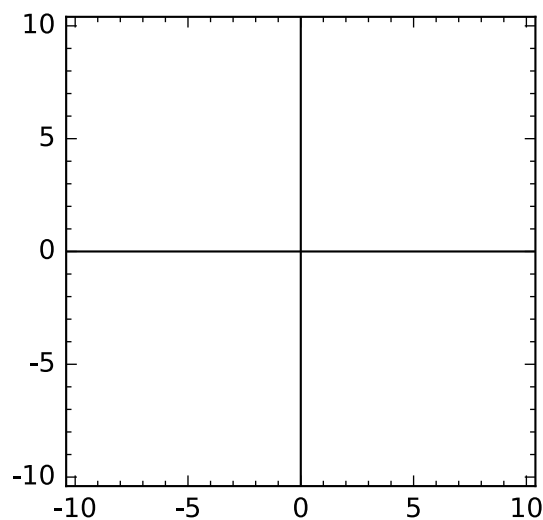
Simp(35, -8, 50, -8, 100, 67)

Genre : 1734

Gamma : 85

Delta : 29478

$$35x^2 - 8xy + 50y^2 - 8x + 100y + 67$$



$$51X^2 + 34Y^2 - 24\sqrt{17}X + 4\sqrt{17}Y + 67$$

#ae

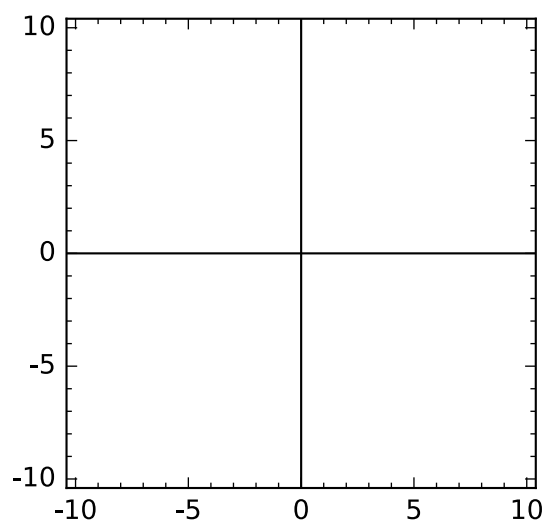
Simp(9, -6, 1, -12, 4, 4)

Genre : 0

Gamma : 10

Delta : 0

$$9x^2 - 6xy + y^2 - 12x + 4y + 4$$



$$10Y^2 - 4\sqrt{10}Y + 4$$

#af

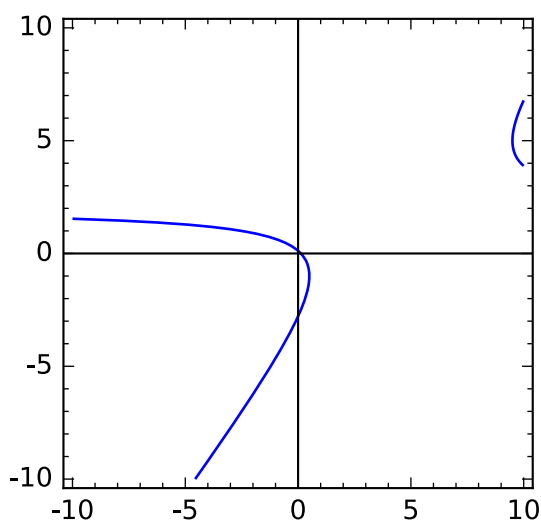
Simp (0, -4, 3, 8, 8, -1)

Genre : -4

Gamma : 3

Delta : -108

$$-4xy + 3y^2 + 8x + 8y - 1$$



$$4X^2 - Y^2 - \frac{8}{5}\sqrt{5}X + \frac{24}{5}\sqrt{5}Y - 1$$

#ag

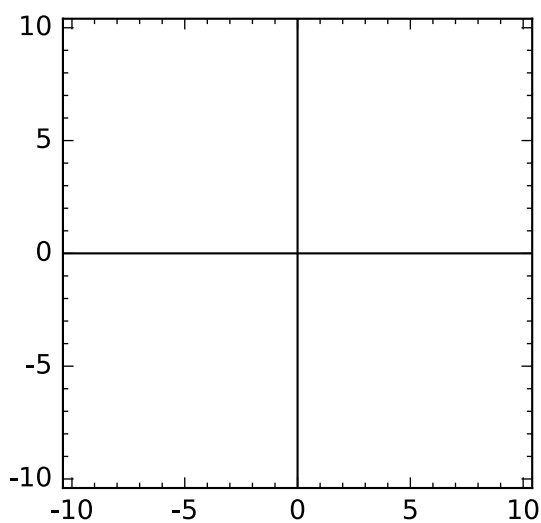
Simp (34, -24, 41, 0, 0, 25)

Genre : 1250

Gamma : 75

Delta : 31250

$$34x^2 - 24xy + 41y^2 + 25$$



$$25X^2 + 50Y^2 + 25$$

#ah

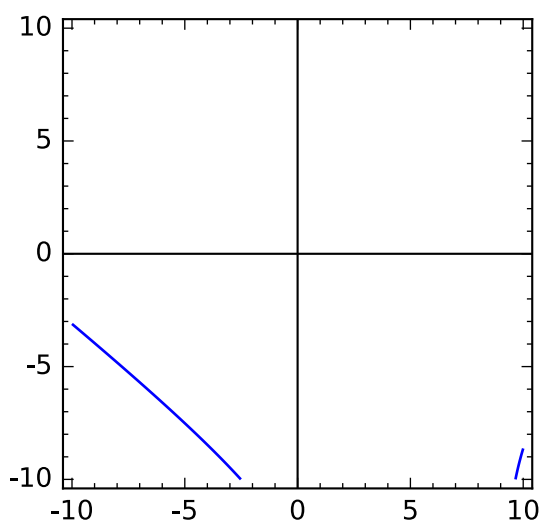
Simp (7, 5, -5, 0, -165, -1320)

$$\text{Genre : } -\frac{165}{4}$$

$$\text{Gamma : } \frac{2}{27225}$$

$$\text{Delta : } \frac{27225}{4}$$

$$7x^2 + 5xy - 5y^2 - 165y - 1320$$



$$\frac{15}{2}X^2 - \frac{11}{2}Y^2 - \frac{165}{26}\sqrt{26}X + \frac{825}{26}\sqrt{26}Y - 1320$$

#ai

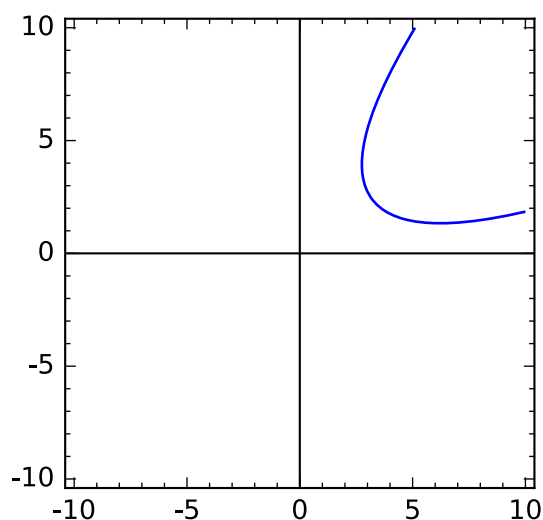
Simp (9, -24, 16, -80, -60, 400)

$$\text{Genre : } 0$$

$$\text{Gamma : } 25$$

$$\text{Delta : } -62500$$

$$9x^2 - 24xy + 16y^2 - 80x - 60y + 400$$



$$25 Y^2 - 100 X + 400$$

#aj

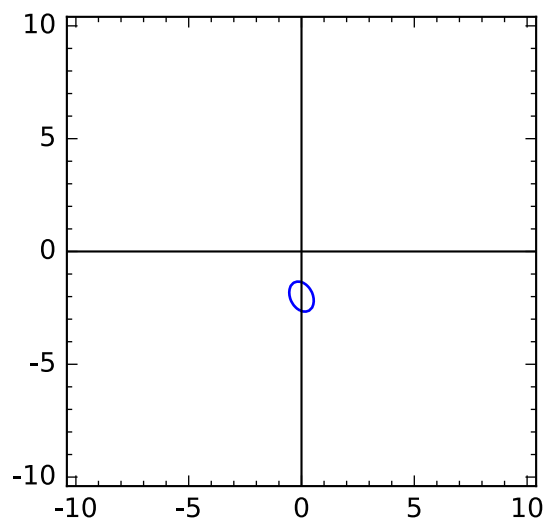
Simp (18, 8, 12, 16, 48, 43)

Genre : 200

Gamma : 30

Delta : -1000

$$18 x^2 + 8 xy + 12 y^2 + 16 x + 48 y + 43$$



$$10 X^2 + 20 Y^2 - 16 \sqrt{5} X + 16 \sqrt{5} Y + 43$$

#ak

Simp (1, 2, 5, 0, -4, 0)

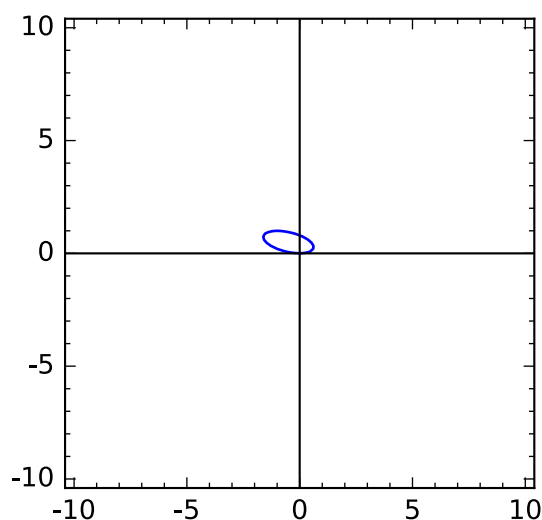
Genre : 4

Gamma : 6

Delta : -4

$$x^2 + 2 xy + 5 y^2 - 4 y$$

$$Y^2 (\sqrt{5} + 3) - X^2 (\sqrt{5} - 3) - \frac{4 Y (\sqrt{5} + 2)}{\sqrt{(\sqrt{5} + 2)^2 + 1}} +$$



$$\frac{4X(\sqrt{5}-2)}{\sqrt{(\sqrt{5}-2)^2+1}}$$

#a1

Simp(1, -2, 6, -2, -28, 46)

Genre : 5

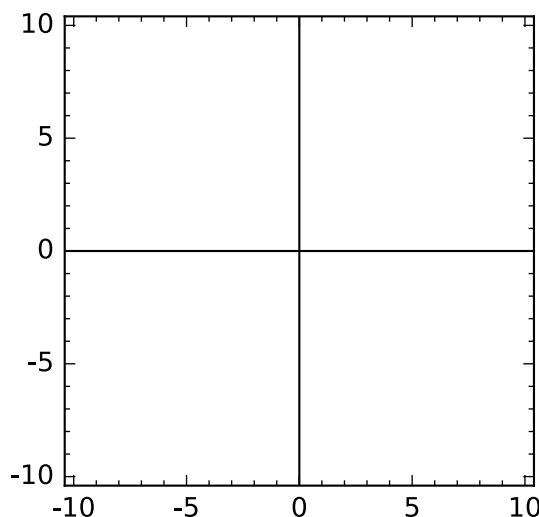
Gamma : 7

Delta : 0

$$x^2 - 2xy + 6y^2 - 2x - 28y + 46$$

$$\frac{1}{2} Y^2 (\sqrt{29} + 7) - \frac{1}{2} X^2 (\sqrt{29} - 7) + 2 Y \left( \frac{7(\sqrt{29} + 5)}{\sqrt{\frac{1}{4}(\sqrt{29} + 5)^2 + 1}} - \frac{1}{\sqrt{\frac{1}{4}(\sqrt{29} + 5)^2 + 1}} \right) -$$

$$2 X \left( \frac{7(\sqrt{29} - 5)}{\sqrt{\frac{1}{4}(\sqrt{29} - 5)^2 + 1}} + \frac{1}{\sqrt{\frac{1}{4}(\sqrt{29} - 5)^2 + 1}} \right) +$$



46

#am

Simp(1, -2, 2, -2, -2, 3)

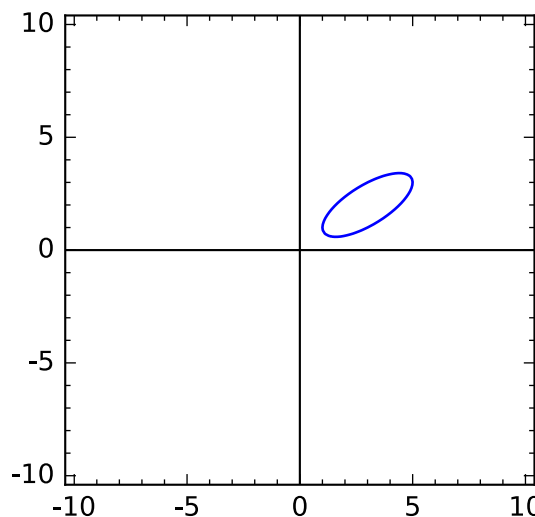
Genre : 1

Gamma : 3

Delta : -2

$$x^2 - 2xy + 2y^2 - 2x - 2y + 3$$

$$\frac{1}{2} Y^2(\sqrt{5} + 3) - \frac{1}{2} X^2(\sqrt{5} - 3) + Y \left( \frac{\sqrt{5} + 1}{\sqrt{\frac{1}{4}(\sqrt{5} + 1)^2 + 1}} - \frac{2}{\sqrt{\frac{1}{4}(\sqrt{5} + 1)^2 + 1}} \right) -$$



$$X \left( \frac{\sqrt{5} - 1}{\sqrt{\frac{1}{4}(\sqrt{5} - 1)^2 + 1}} + \frac{2}{\sqrt{\frac{1}{4}(\sqrt{5} - 1)^2 + 1}} \right) + 3$$

#an

Simp(1, 1, -2, -2, -2, -3)

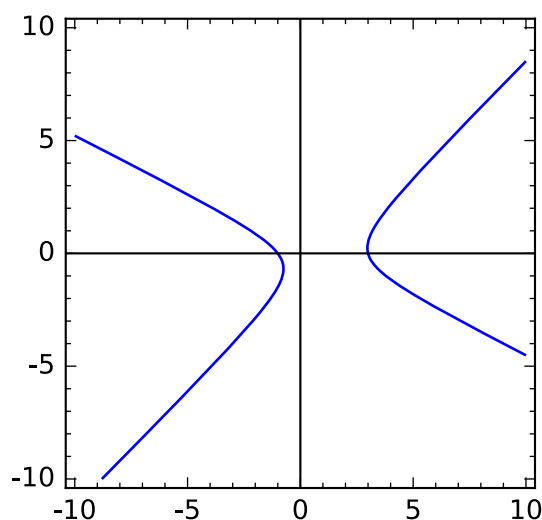
Genre :  $-\frac{9}{4}$

Gamma : -1

Delta :  $\frac{35}{4}$

$$x^2 + xy - 2y^2 - 2x - 2y - 3$$

$$-\frac{1}{2} X^2(\sqrt{10} + 1) + \frac{1}{2} Y^2(\sqrt{10} - 1) + 2X \left( \frac{\sqrt{10} + 3}{\sqrt{(\sqrt{10} + 3)^2 + 1}} - \frac{1}{\sqrt{(\sqrt{10} + 3)^2 + 1}} \right) -$$



$$2Y \left( \frac{\sqrt{10}-3}{\sqrt{(\sqrt{10}-3)^2+1}} + \frac{1}{\sqrt{(\sqrt{10}-3)^2+1}} \right) - 3$$

#a0

Simp (1, 1, -2, -2, -2, -3)

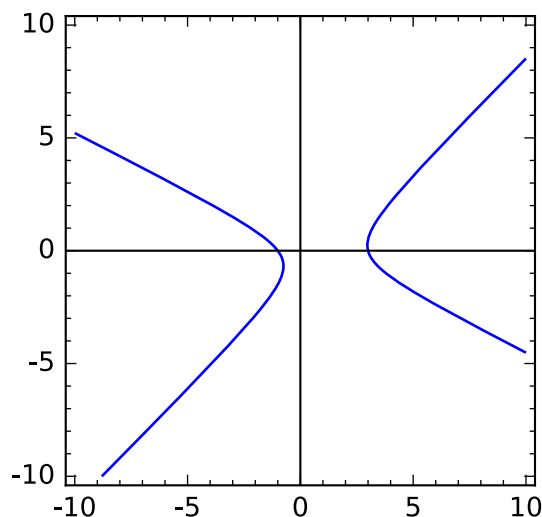
Genre :  $-\frac{9}{4}$

Gamma : -1

Delta :  $\frac{35}{4}$

$$x^2 + xy - 2y^2 - 2x - 2y - 3$$

$$-\frac{1}{2}X^2(\sqrt{10}+1) + \frac{1}{2}Y^2(\sqrt{10}-1) + 2X \left( \frac{\sqrt{10}+3}{\sqrt{(\sqrt{10}+3)^2+1}} - \frac{1}{\sqrt{(\sqrt{10}+3)^2+1}} \right) -$$



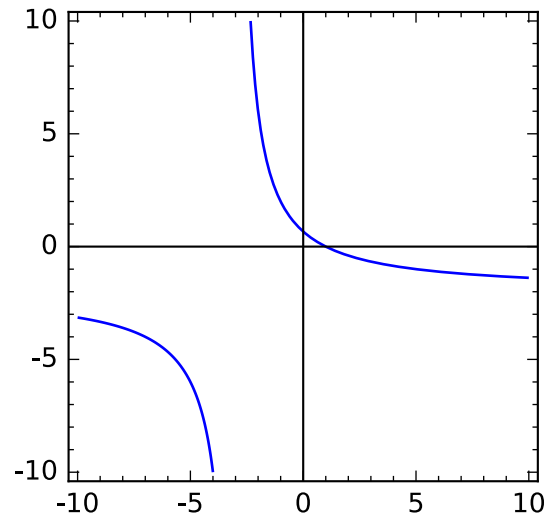
$$2Y \left( \frac{\sqrt{10}-3}{\sqrt{(\sqrt{10}-3)^2+1}} + \frac{1}{\sqrt{(\sqrt{10}-3)^2+1}} \right) - 3$$

#ap

Simp (0, 1, 0, 2, 3, -2)



Genre :  $-\frac{1}{4}$   
 Gamma : 0  
 Delta : 2  
 $xy + 2x + 3y - 2$

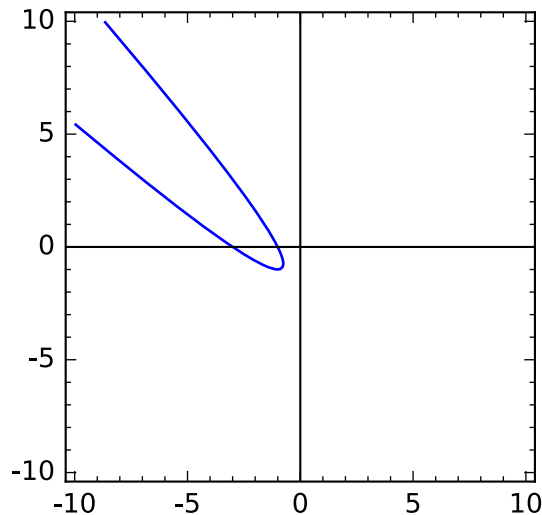


$$-\frac{1}{2}X^2 + \frac{1}{2}Y^2 - \frac{1}{2}\sqrt{2}X + \frac{5}{2}\sqrt{2}Y - 2$$

#aq

Simp (1, 2, 1, 4, 3, 3)

Genre : 0  
 Gamma : 2  
 Delta :  $-\frac{1}{4}$   
 $x^2 + 2xy + y^2 + 4x + 3y + 3$



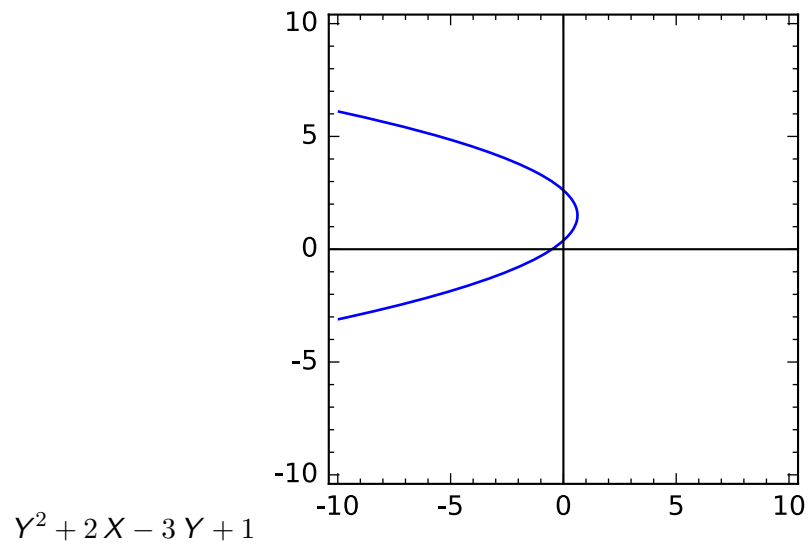
$$2Y^2 + \frac{1}{2}\sqrt{2}X + \frac{7}{2}\sqrt{2}Y + 3$$

#ar

Simp (0, 0, 1, 2, -3, 1)

Genre : 0

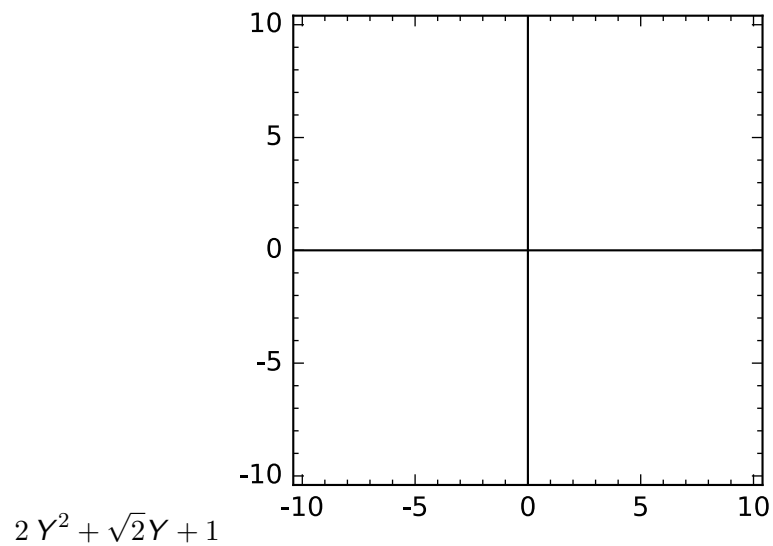
Gamma : 1  
 Delta : -1  
 $y^2 + 2x - 3y + 1$



#a.s

Simp (1, 2, 1, 1, 1, 1)

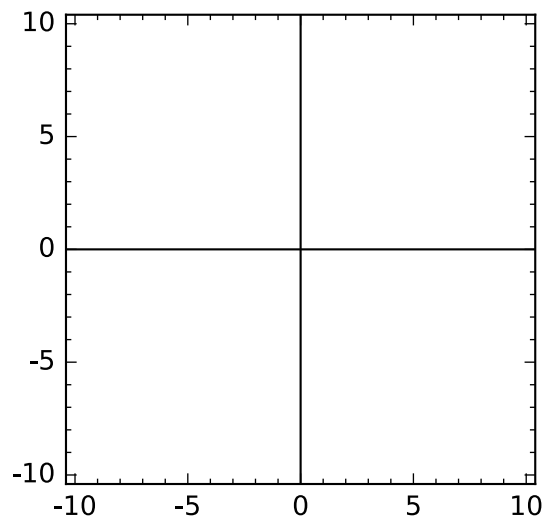
Genre : 0  
 Gamma : 2  
 Delta : 0  
 $x^2 + 2xy + y^2 + x + y + 1$



#at

Simp (1, -2, 1, -2, 2, 1)

Genre : 0  
 Gamma : 2  
 Delta : 0  
 $x^2 - 2xy + y^2 - 2x + 2y + 1$



$$2Y^2 - 2\sqrt{2}Y + 1$$

#au

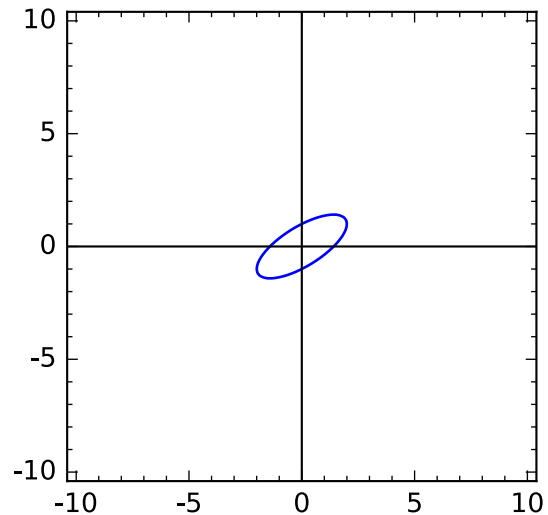
Simp (1, -2, 2, 0, 0, -2)

Genre : 1

Gamma : 3

Delta : -2

$$x^2 - 2xy + 2y^2 - 2$$



$$\frac{1}{2} Y^2 (\sqrt{5} + 3) - \frac{1}{2} X^2 (\sqrt{5} - 3) - 2$$

#av

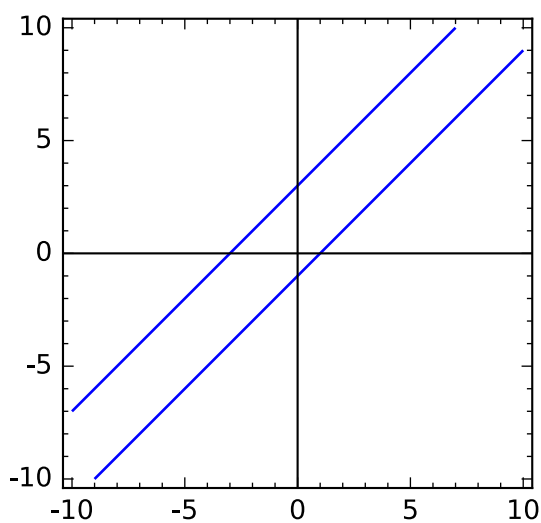
Simp (1, -2, 1, 2, -2, -3)

Genre : 0

Gamma : 2

Delta : 0

$$x^2 - 2xy + y^2 + 2x - 2y - 3$$



$$2Y^2 + 2\sqrt{2}Y - 3$$

expand((x+y-2)^2 - (x-3\*y))

$$x^2 + 2xy + y^2 - 5x - y + 4$$

#aw

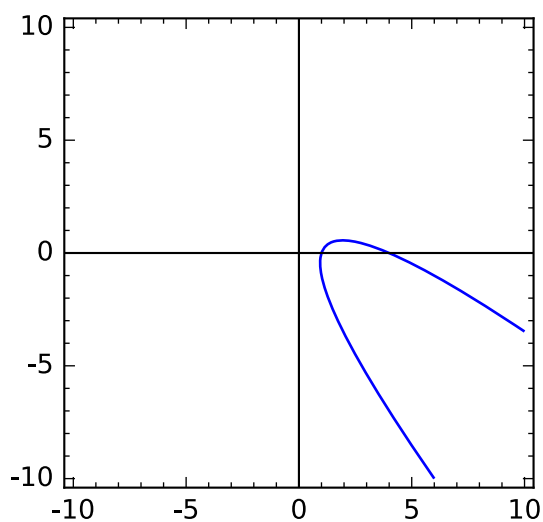
Simp(1, 2, 1, -5, -1, 4)

Genre : 0

Gamma : 2

Delta : -4

$$x^2 + 2xy + y^2 - 5x - y + 4$$



$$2Y^2 - 2\sqrt{2}X - 3\sqrt{2}Y + 4$$

#ax

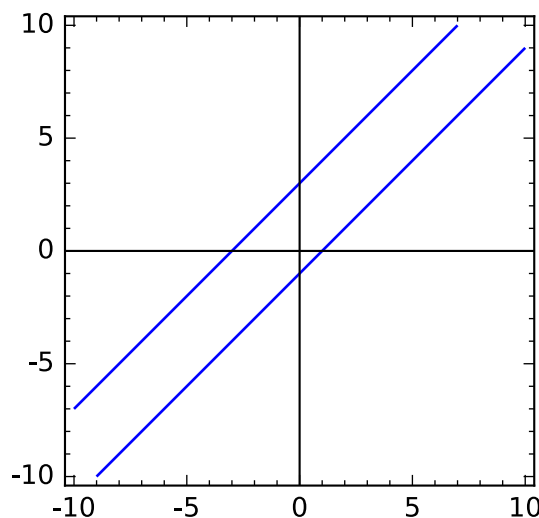
Simp(1, -2, 1, 2, -2, -3)

Genre : 0

Gamma : 2

Delta : 0

$$x^2 - 2xy + y^2 + 2x - 2y - 3$$



$$2Y^2 + 2\sqrt{2}Y - 3$$

#a.y

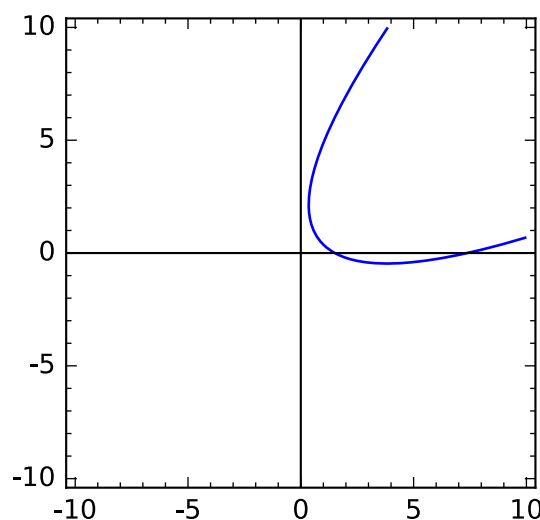
Simp(9, -24, 16, -80, -60, 100)

Genre : 0

Gamma : 25

Delta : -62500

$$9x^2 - 24xy + 16y^2 - 80x - 60y + 100$$



$$25Y^2 - 100X + 100$$

#a.z

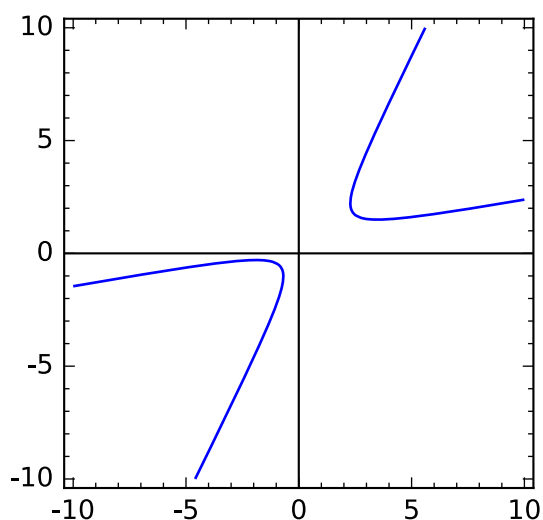
Simp(4, -24, 11, 8, 6, 15)

Genre : -100

Gamma : 15

Delta : -2000

$$4x^2 - 24xy + 11y^2 + 8x + 6y + 15$$



$$-5X^2 + 20Y^2 + 10X + 15$$

#ba

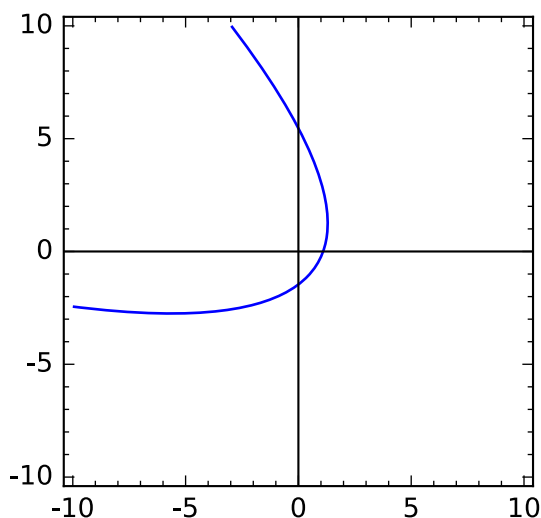
Simp(1, 2\*sqrt(3), 3, 12\*sqrt(3), -12, -24)

Genre : 0

Gamma : 4

Delta : -576

$$2\sqrt{3}xy + x^2 + 3y^2 + 12\sqrt{3}x - 12y - 24$$



$$24\sqrt{3}\sqrt{\frac{1}{3}}X + 4Y^2 - 24$$

#bb

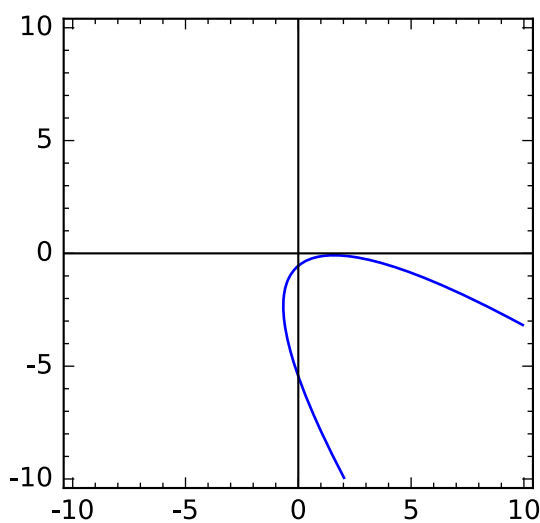
Simp(1, 2, 1, -3, 6, 3)

Genre : 0

Gamma : 2

Delta :  $-\frac{81}{4}$

$$x^2 + 2xy + y^2 - 3x + 6y + 3$$



$$2Y^2 - \frac{9}{2}\sqrt{2}X + \frac{3}{2}\sqrt{2}Y + 3$$

#bc

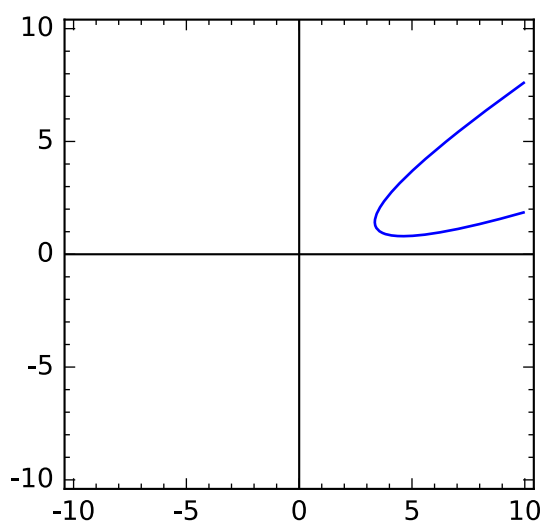
Simp(1, -4, 4, -6, 2, 17)

Genre : 0

Gamma : 5

Delta : -25

$$x^2 - 4xy + 4y^2 - 6x + 2y + 17$$



$$5Y^2 - 2\sqrt{5}X - 2\sqrt{5}Y + 17$$

#bd

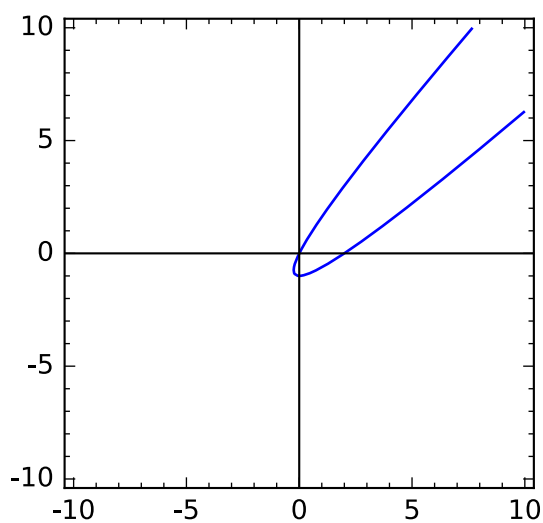
Simp(1, -2, 1, -2, 1, 0)

Genre : 0

Gamma : 2

Delta :  $-\frac{1}{4}$

$$x^2 - 2xy + y^2 - 2x + y$$



$$2Y^2 - \frac{1}{2}\sqrt{2}X - \frac{3}{2}\sqrt{2}Y$$

#be

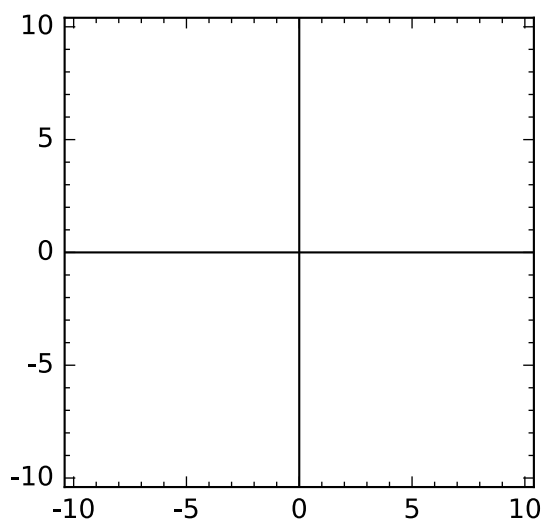
Simp (34, 24, 41, -112, 34, 129)

Genre : 1250

Gamma : 75

Delta : 0

$$34x^2 + 24xy + 41y^2 - 112x + 34y + 129$$



$$25X^2 + 50Y^2 - 110X - 40Y + 129$$

#bf

Simp (36, -24, 29, -96, 82, -91)

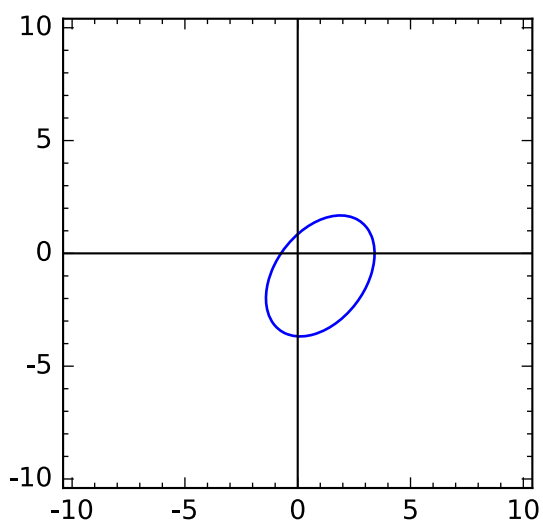
Genre : 900

Gamma : 65

Delta : -162000

$$36x^2 - 24xy + 29y^2 - 96x + 82y - 91$$





$$45X^2 + 20Y^2 - 126X + 8Y - 91$$

#bg

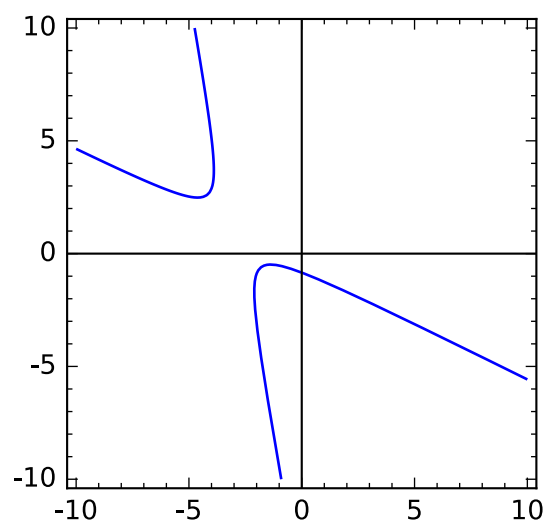
Simp(11, 24, 4, 42, 64, 51)

Genre : -100

Gamma : 15

Delta : -2000

$$11x^2 + 24xy + 4y^2 + 42x + 64y + 51$$



$$-5X^2 + 20Y^2 - 26X + 72Y + 51$$

#bh

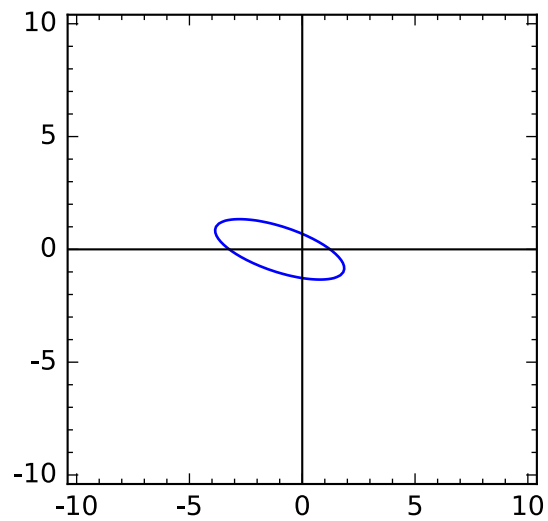
Simp(9, 24, 41, 18, 24, -36)

Genre : 225

Gamma : 50

Delta : -10125

$$9x^2 + 24xy + 41y^2 + 18x + 24y - 36$$



$$45X^2 + 5Y^2 + 9\sqrt{10}X + 3\sqrt{10}Y - 36$$

#bi

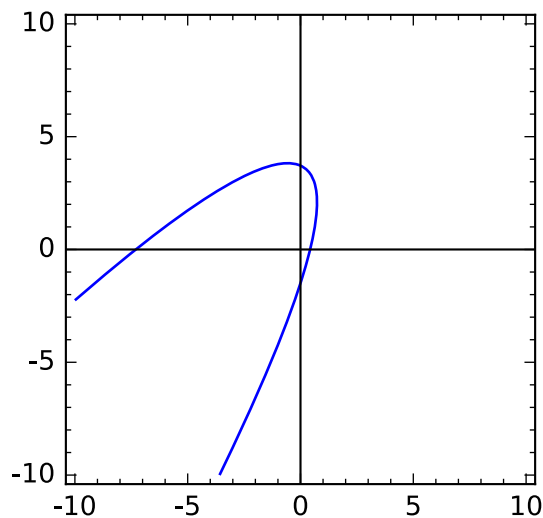
Simp(16, -24, 9, 110, -20, -50)

Genre : 0

Gamma : 25

Delta : -15625

$$16x^2 - 24xy + 9y^2 + 110x - 20y - 50$$



$$25Y^2 + 50X + 100Y - 50$$

#bj

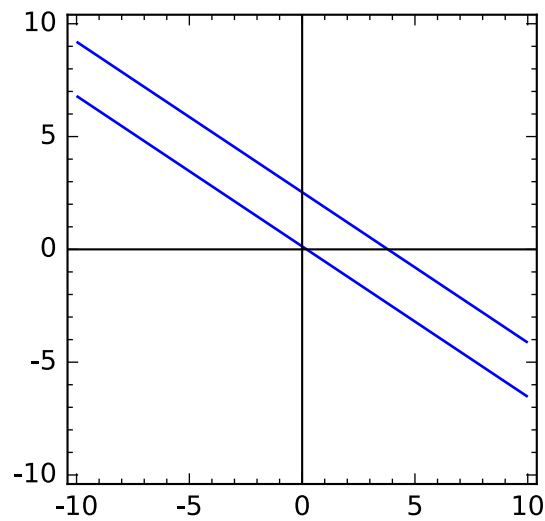
Simp(4, 12, 9, -16, -24, 3)

Genre : 0

Gamma : 13

Delta : 0

$$4x^2 + 12xy + 9y^2 - 16x - 24y + 3$$



$$13 Y^2 - 8 \sqrt{13} Y + 3$$

#bk

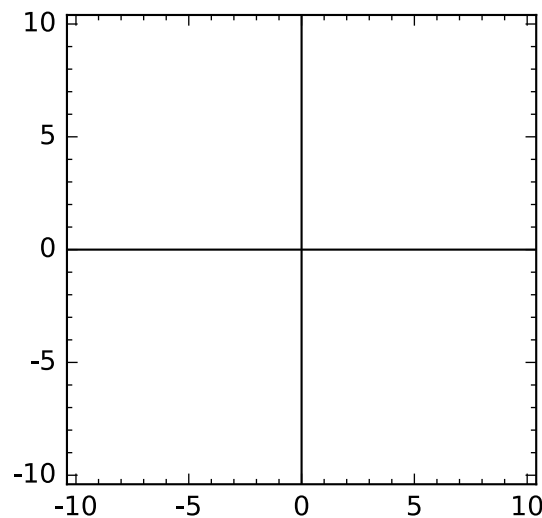
Simp(9, -24, 16, 120, -160, 425)

Genre : 0

Gamma : 25

Delta : 0

$$9 x^2 - 24 xy + 16 y^2 + 120 x - 160 y + 425$$



$$25 Y^2 + 200 Y + 425$$

#bl

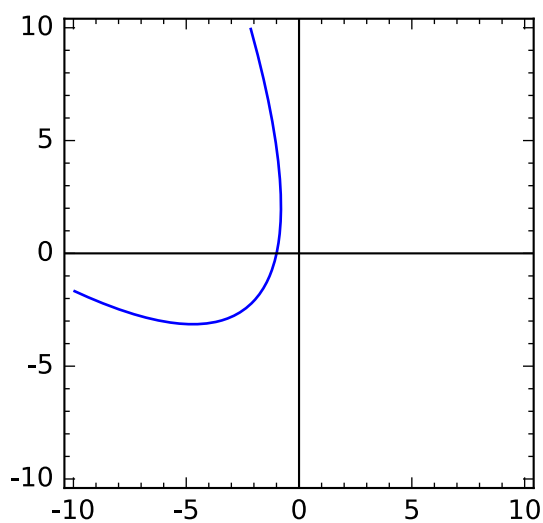
Simp(16, 24, 9, 226, -18, 209)

Genre : 0

Gamma : 25

Delta : -140625

$$16 x^2 + 24 xy + 9 y^2 + 226 x - 18 y + 209$$



$$25 Y^2 + 150 X + 170 Y + 209$$

#bm

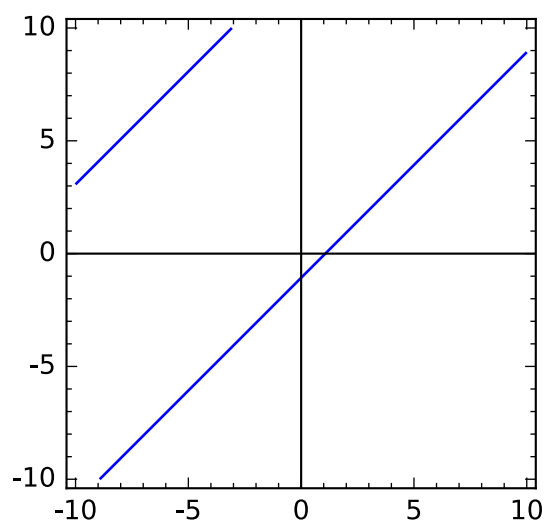
Simp (1, -2, 1, 12, -12, -14)

Genre : 0

Gamma : 2

Delta : 0

$$x^2 - 2xy + y^2 + 12x - 12y - 14$$



$$2 Y^2 + 12\sqrt{2}Y - 14$$

#bn

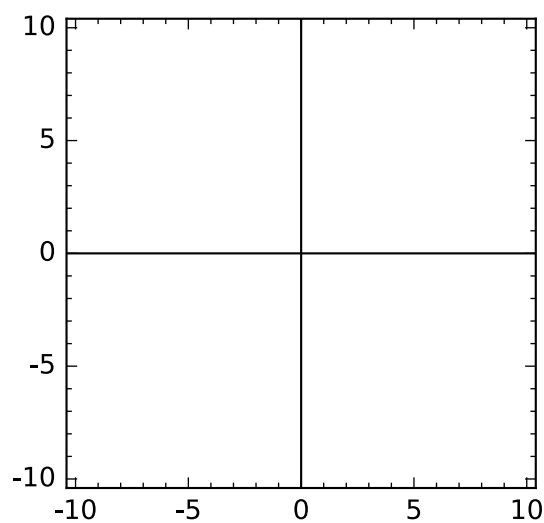
Simp (9, 12, 4, -6, -4, 1)

Genre : 0

Gamma : 13

Delta : 0

$$9x^2 + 12xy + 4y^2 - 6x - 4y + 1$$



$$13Y^2 - 2\sqrt{13}Y + 1$$

#bo

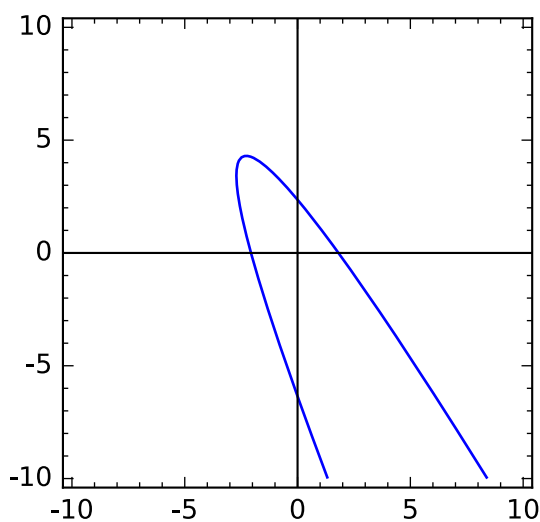
Simp(4, 4, 1, 1, 4, -15)

Genre : 0

Gamma : 5

Delta :  $-\frac{49}{4}$

$$4x^2 + 4xy + y^2 + x + 4y - 15$$



$$5Y^2 - \frac{7}{5}\sqrt{5}X + \frac{6}{5}\sqrt{5}Y - 15$$

#bp

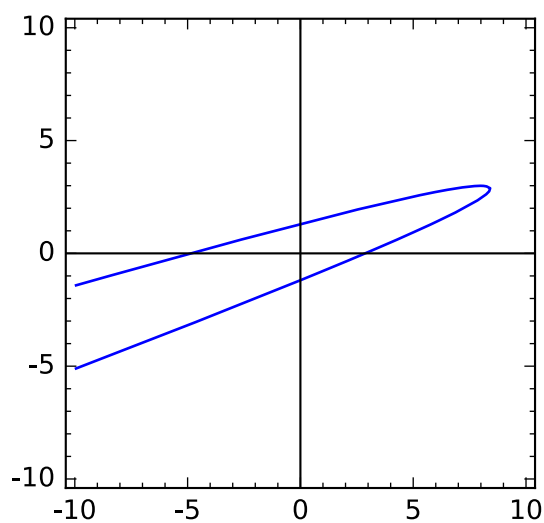
Simp(1, -6, 9, 2, -1, -14)

Genre : 0

Gamma : 10

Delta :  $-\frac{25}{4}$

$$x^2 - 6xy + 9y^2 + 2x - y - 14$$



$$10 Y^2 + \frac{1}{2} \sqrt{10} X + \frac{1}{2} \sqrt{10} Y - 14$$

#bq

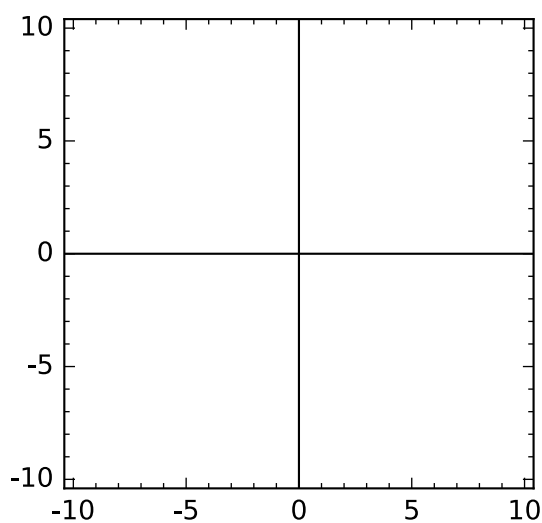
Simp(4, -20, 25, -1, 3, 11)

Genre : 0

Gamma : 29

Delta :  $-\frac{1}{4}$

$$4x^2 - 20xy + 25y^2 - x + 3y + 11$$



$$29 Y^2 + \frac{1}{29} \sqrt{29} X - \frac{17}{29} \sqrt{29} Y + 11$$

#br

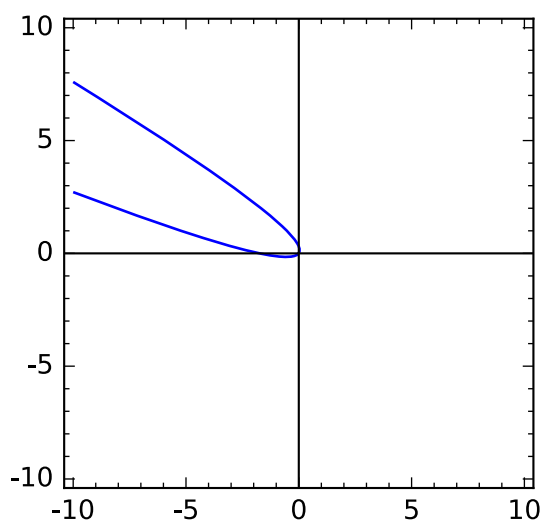
Simp(4, 16, 16, 7, -5, 0)

Genre : 0

Gamma : 20

Delta : -361

$$4x^2 + 16xy + 16y^2 + 7x - 5y$$



$$20 Y^2 + \frac{19}{5} \sqrt{5} X - \frac{3}{5} \sqrt{5} Y$$

#bs

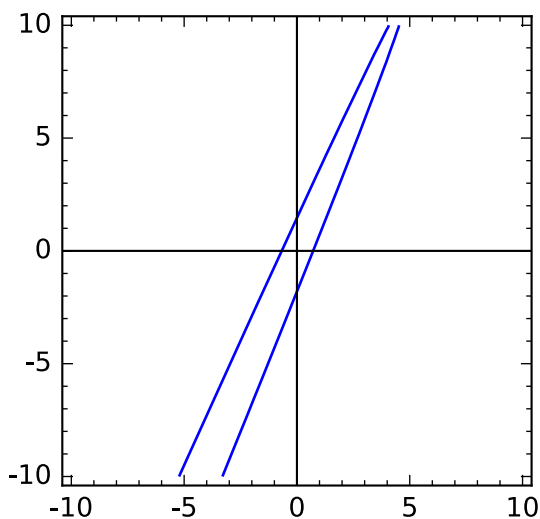
Simp (49, -42, 9, -2, 3, -24)

Genre : 0

Gamma :  $\frac{58}{225}$

Delta :  $-\frac{4}{4}$

$$49 x^2 - 42 xy + 9 y^2 - 2 x + 3 y - 24$$



$$58 Y^2 + \frac{15}{58} \sqrt{58} X - \frac{23}{58} \sqrt{58} Y - 24$$

#bt

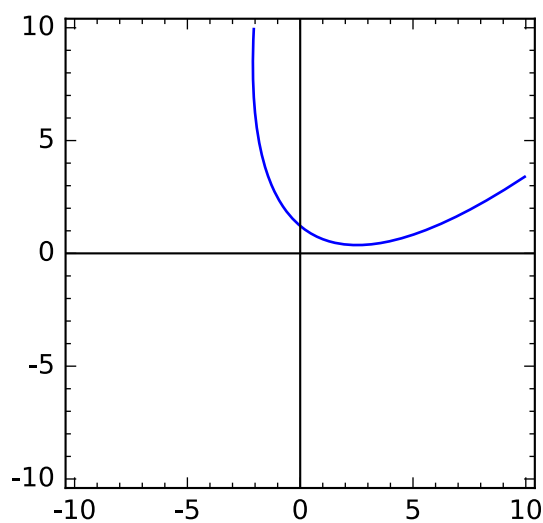
Simp (3, -2\*sqrt(3), 1, -8\*sqrt(3), -24, 16\*sqrt(3))

Genre : 0

Gamma : 4

Delta :  $-48 \sqrt{3} (\sqrt{3} + 1) + 48 \sqrt{3} - 624$

$$-2 \sqrt{3} xy + 3 x^2 + y^2 - 8 \sqrt{3} x - 24 y + 16 \sqrt{3}$$



$$4Y^2 - 16\sqrt{3}X + 16\sqrt{3}$$

#bu

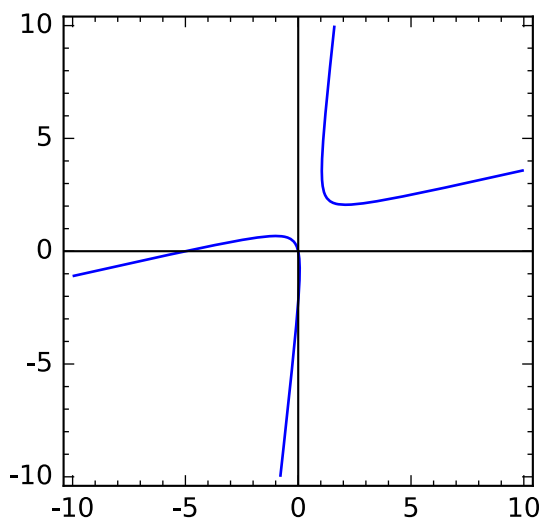
Simp(2, -4\*sqrt(5), 1, 10, sqrt(5), 0)

Genre : -18

Gamma :  $\frac{3}{155}$

Delta :  $-\frac{2}{2}$

$$-4\sqrt{5}xy + 2x^2 + y^2 + \sqrt{5}y + 10x$$



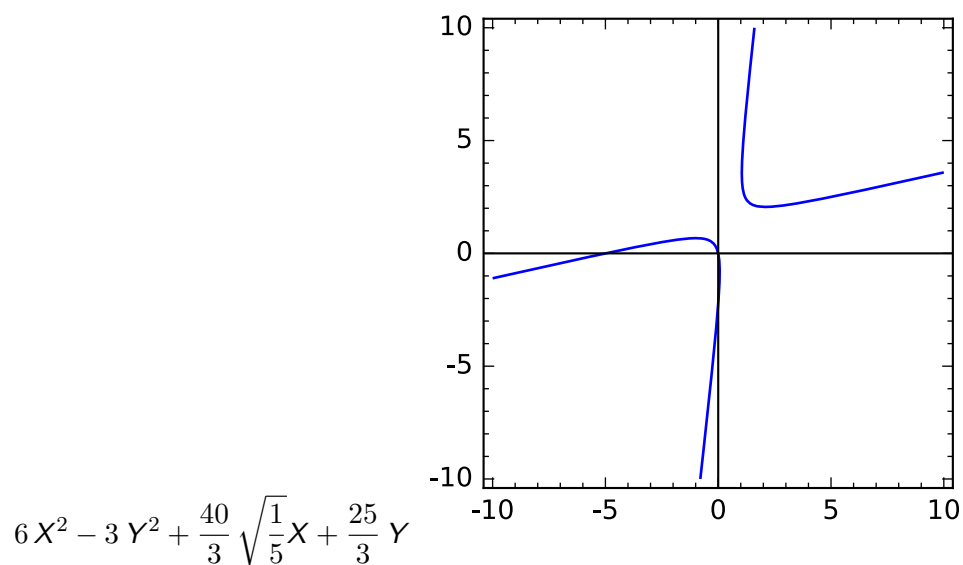
$$6X^2 - 3Y^2 + \frac{40}{3}\sqrt{\frac{1}{5}}X + \frac{25}{3}Y$$

Gamma :  $\frac{3}{155}$

Delta :  $-\frac{2}{2}$

$$-4\sqrt{5}xy + 2x^2 + y^2 + \sqrt{5}y + 10x$$





#bv

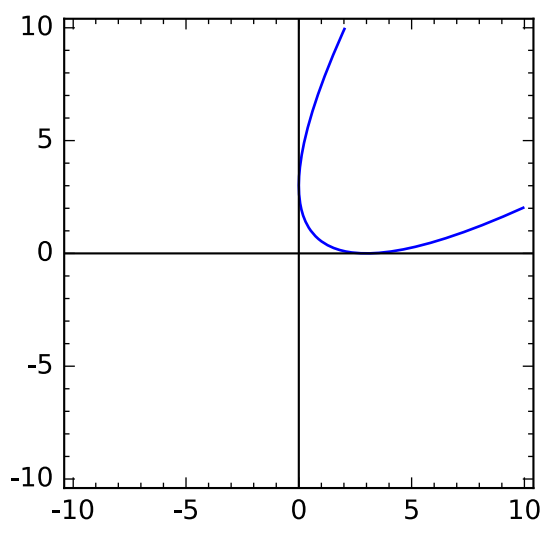
Simp (1, -2, 1, -6, -6, 9)

Genre : 0

Gamma : 2

Delta : -36

$$x^2 - 2xy + y^2 - 6x - 6y + 9$$



#bw

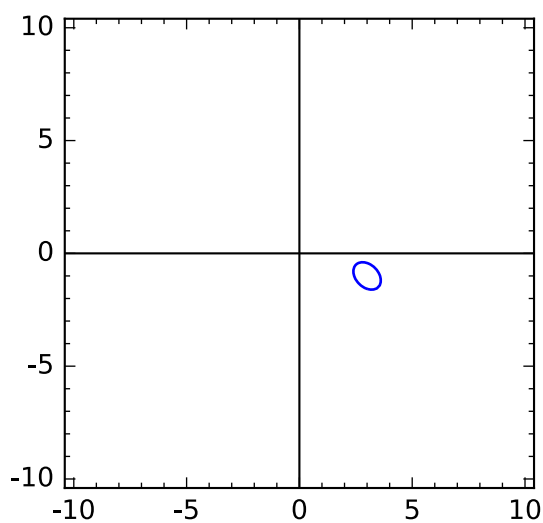
Simp (3, 2, 3, -16, 0, 23)

Genre : 8

Gamma : 6

Delta : -8

$$3x^2 + 2xy + 3y^2 - 16x + 23$$



$$4X^2 + 2Y^2 - 8\sqrt{2}X - 8\sqrt{2}Y + 23$$

#bx

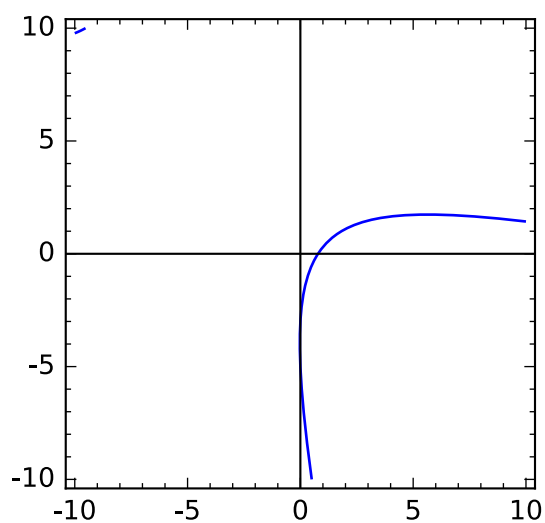
Simp (1, 5, 1, -20, 8, 15)

Genre :  $-\frac{21}{4}$

Gamma :  $\frac{2}{1579}$

Delta :  $-\frac{4}{1579}$

$$x^2 + 5xy + y^2 - 20x + 8y + 15$$



$$-\frac{3}{2}X^2 + \frac{7}{2}Y^2 - 14\sqrt{2}X - 6\sqrt{2}Y + 15$$

#by

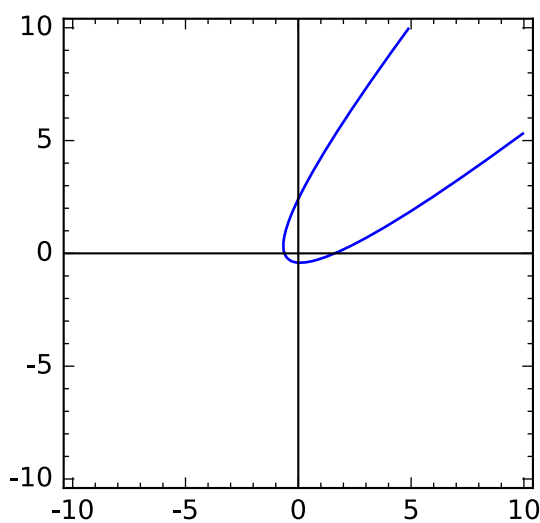
Simp (1, -2, 1, -1, -2, -1)

Genre : 0

Gamma :  $\frac{2}{9}$

Delta :  $-\frac{9}{4}$

$$x^2 - 2xy + y^2 - x - 2y - 1$$



$$2Y^2 - \frac{3}{2}\sqrt{2}X + \frac{1}{2}\sqrt{2}Y - 1$$

#bz

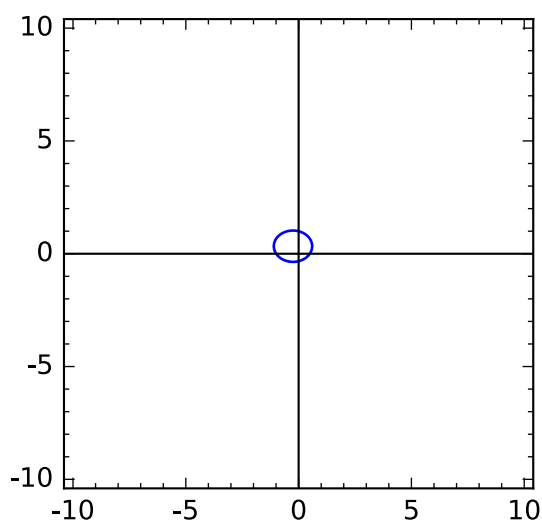
Simp(2, 0, 3, 1, -2, -1)

Genre : 6

Gamma :  $\frac{5}{4}$

Delta :  $-\frac{35}{4}$

$$2x^2 + 3y^2 + x - 2y - 1$$



$$2X^2 + 3Y^2 + X - 2Y - 1$$

#ca

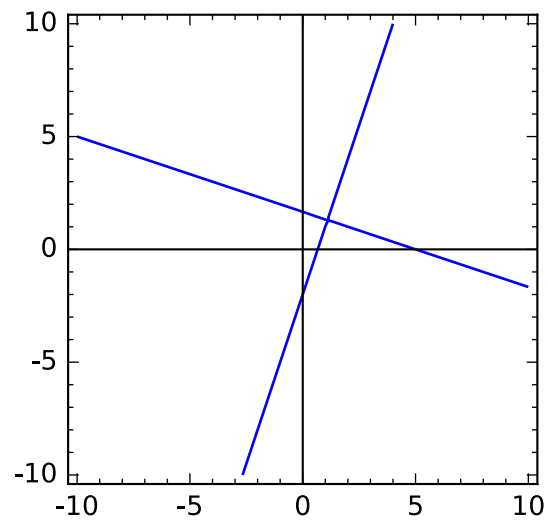
Simp(3, 8, -3, -17, -1, 10)

Genre : -25

Gamma : 0

Delta : 0

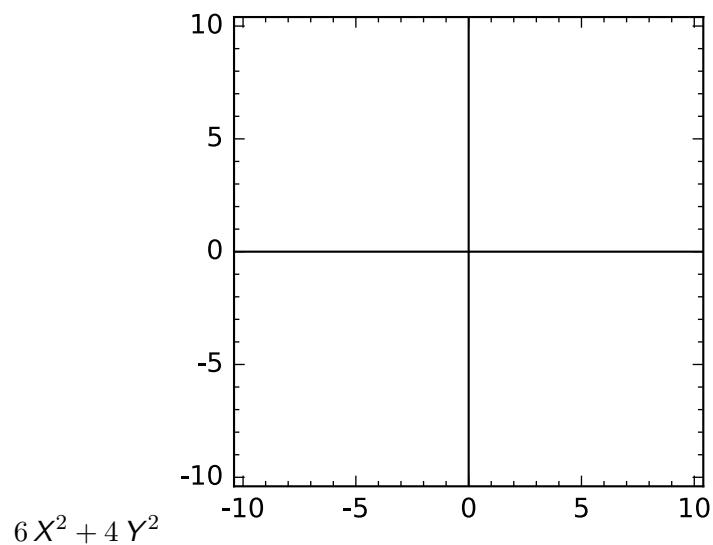
$$3x^2 + 8xy - 3y^2 - 17x - y + 10$$



$$-5X^2 + 5Y^2 - 3\sqrt{5}X - 7\sqrt{5}Y + 10$$

```
#cb
# Avec un paramètre? Plutôt à l'exercice suivant, non?
# genre -3
# Gamma : 2
# Delta  $3a^2$ 
var('a')
#Simp(1, -4, 1, -2*a, 4*a, 0)
a
```

```
#cc
Simp(5, 2, 5, 0, 0, 0)
Genre : 24
Gamma : 10
Delta : 0
 $5x^2 + 2xy + 5y^2$ 
```



$$6X^2 + 4Y^2$$

#cd

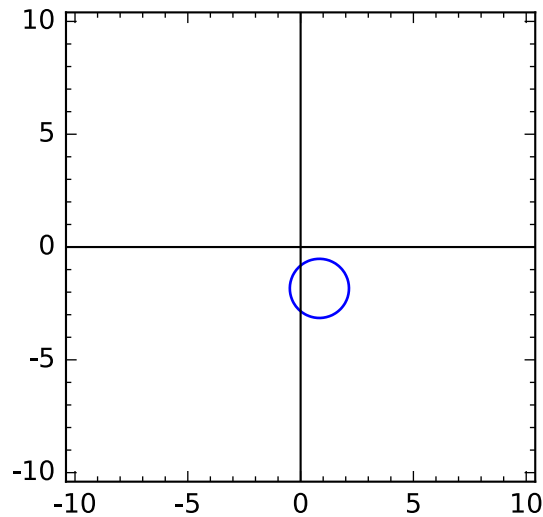
Simp(3, 0, 3, -5, 11, 7)

Genre : 9

Gamma :  $\frac{6}{93}$

Delta :  $-\frac{93}{2}$

$$3x^2 + 3y^2 - 5x + 11y + 7$$



$$3X^2 + 3Y^2 - 5X + 11Y + 7$$

#ce

Simp(1, -2, -1, -4, -8, 8)

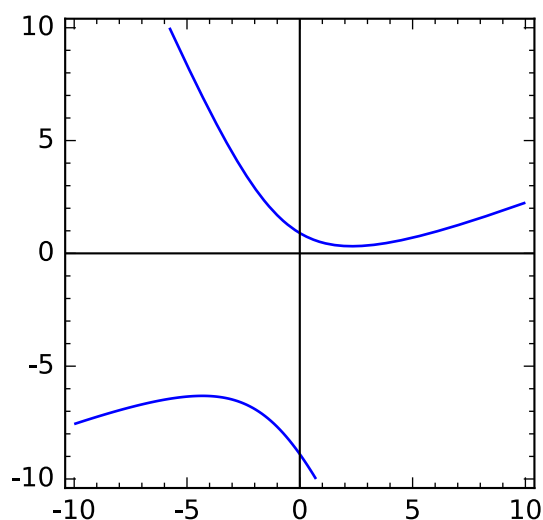
Genre : -2

Gamma : 0

Delta : -44

$$x^2 - 2xy - y^2 - 4x - 8y + 8$$

$$-\sqrt{2}X^2 + \sqrt{2}Y^2 - 4X \left( \frac{2(\sqrt{2}+1)}{\sqrt{(\sqrt{2}+1)^2+1}} + \frac{1}{\sqrt{(\sqrt{2}+1)^2+1}} \right) +$$



$$4Y \left( \frac{2(\sqrt{2}-1)}{\sqrt{(\sqrt{2}-1)^2+1}} - \frac{1}{\sqrt{(\sqrt{2}-1)^2+1}} \right) + 8$$

#cf

Simp(6, 1, -1, -1, 3, 0)

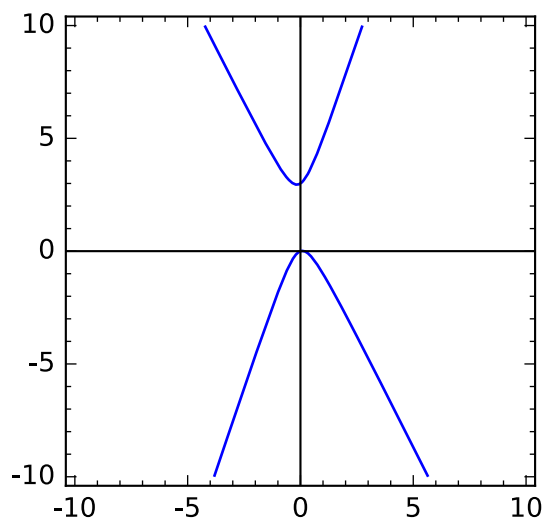
Genre :  $-\frac{25}{4}$

Gamma : 5

Delta : -14

$6x^2 + xy - y^2 - x + 3y$

$$\frac{5}{2}Y^2(\sqrt{2}+1) - \frac{5}{2}X^2(\sqrt{2}-1) - X \left( \frac{3(5\sqrt{2}+7)}{\sqrt{(5\sqrt{2}+7)^2+1}} + \frac{1}{\sqrt{(5\sqrt{2}+7)^2+1}} \right) +$$



$$Y \left( \frac{3(5\sqrt{2}-7)}{\sqrt{(5\sqrt{2}-7)^2+1}} - \frac{1}{\sqrt{(5\sqrt{2}-7)^2+1}} \right)$$

#cg

Simp(1, -1, 0, 5, -5, 0)

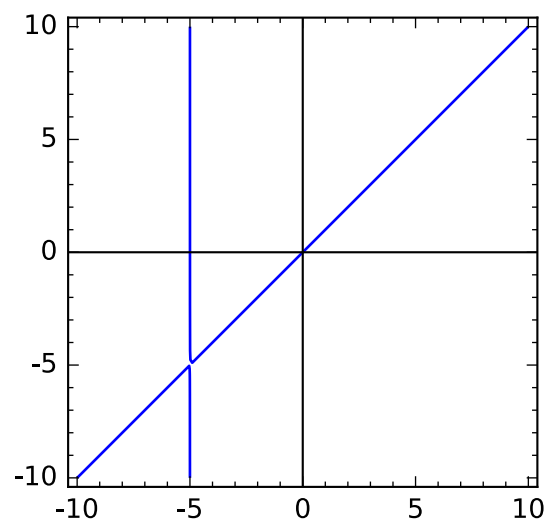
Genre :  $-\frac{1}{4}$

Gamma : 1

Delta : 0

$$x^2 - xy + 5x - 5y$$

$$\frac{1}{2} Y^2(\sqrt{2}+1) - \frac{1}{2} X^2(\sqrt{2}-1) - 5X \left( \frac{\sqrt{2}+1}{\sqrt{(\sqrt{2}+1)^2+1}} - \frac{1}{\sqrt{(\sqrt{2}+1)^2+1}} \right) +$$



$$5Y \left( \frac{\sqrt{2}-1}{\sqrt{(\sqrt{2}-1)^2+1}} + \frac{1}{\sqrt{(\sqrt{2}-1)^2+1}} \right)$$

#ch

Simp (2, 2, 1, -2, -6, 9)

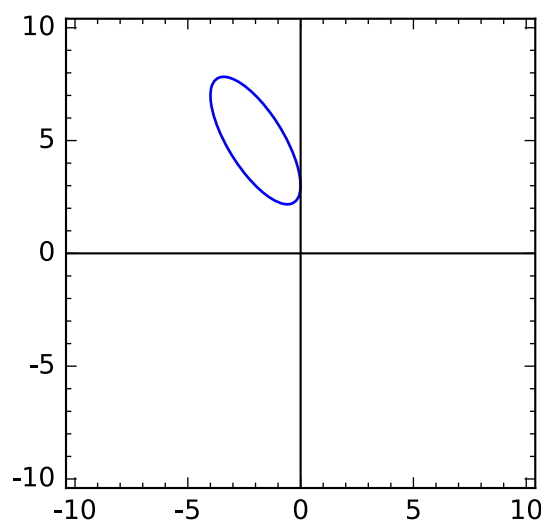
Genre : 1

Gamma : 3

Delta : -4

$$2x^2 + 2xy + y^2 - 2x - 6y + 9$$

$$\frac{1}{2} Y^2(\sqrt{5}+3) - \frac{1}{2} X^2(\sqrt{5}-3) + X \left( \frac{3(\sqrt{5}+1)}{\sqrt{\frac{1}{4}(\sqrt{5}+1)^2+1}} - \frac{2}{\sqrt{\frac{1}{4}(\sqrt{5}+1)^2+1}} \right) -$$



$$Y \left( \frac{3(\sqrt{5}-1)}{\sqrt{\frac{1}{4}(\sqrt{5}-1)^2+1}} + \frac{2}{\sqrt{\frac{1}{4}(\sqrt{5}-1)^2+1}} \right) + 9$$

#ci

Simp(2, -2, 1, -4, 0, 8)

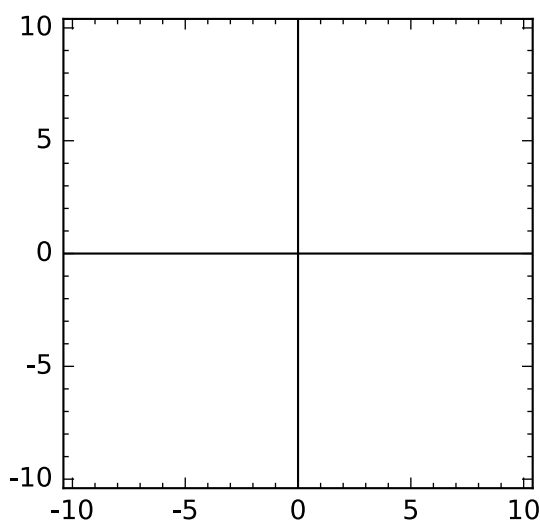
Genre : 1

Gamma : 3

Delta : 4

$$2x^2 - 2xy + y^2 - 4x + 8$$

$$\frac{1}{2} Y^2 (\sqrt{5} + 3) - \frac{1}{2} X^2 (\sqrt{5} - 3) - \frac{4X}{\sqrt{\frac{1}{4}(\sqrt{5}+1)^2+1}} - \frac{4Y}{\sqrt{\frac{1}{4}(\sqrt{5}-1)^2+1}} +$$



8

#cj

Simp(9, 6, 1, -6, 2, 0)

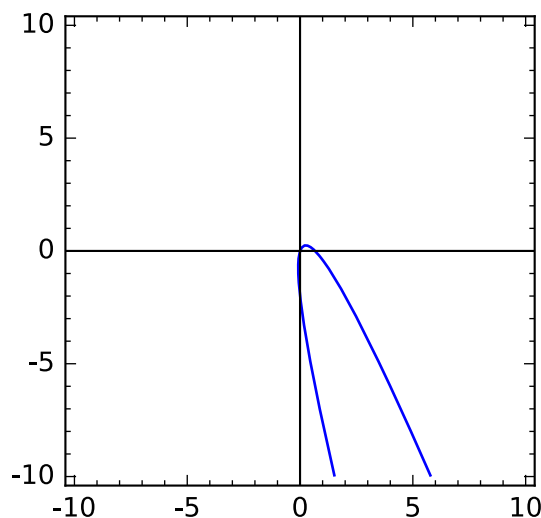
Genre : 0

Gamma : 10

Delta : -36



$$9x^2 + 6xy + y^2 - 6x + 2y$$



$$10Y^2 - \frac{6}{5}\sqrt{10}X - \frac{8}{5}\sqrt{10}Y$$

#ck

Simp (1, 2, -1, 0, -8, 6)

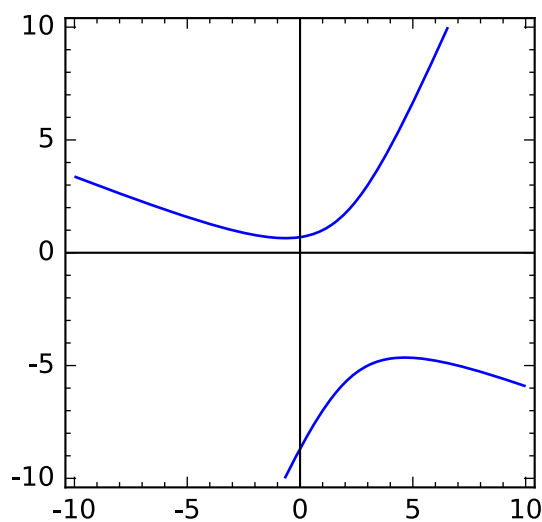
Genre : -2

Gamma : 0

Delta : -28

$$x^2 + 2xy - y^2 - 8y + 6$$

$$-\sqrt{2}X^2 + \sqrt{2}Y^2 + \frac{8X(\sqrt{2}+1)}{\sqrt{(\sqrt{2}+1)^2+1}} - \frac{8Y(\sqrt{2}-1)}{\sqrt{(\sqrt{2}-1)^2+1}} +$$



6

#cl

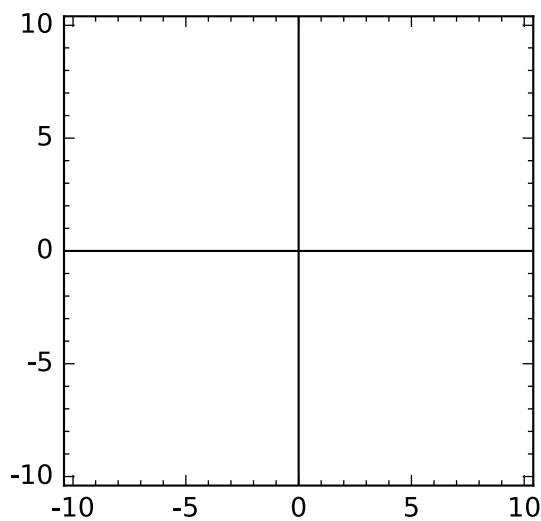
Simp (9, 0, 4, 0, 4, 1)

Genre : 36

Gamma : 13

Delta : 0

$$9x^2 + 4y^2 + 4y + 1$$



$$4X^2 + 9Y^2 + 4X + 1$$

#cm

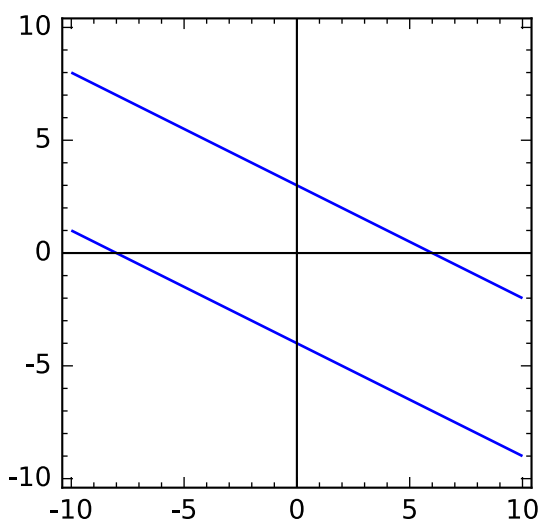
Simp(1, 4, 4, 2, 4, -48)

Genre : 0

Gamma : 5

Delta : 0

$$x^2 + 4xy + 4y^2 + 2x + 4y - 48$$



$$5Y^2 + 2\sqrt{5}Y - 48$$

#cn

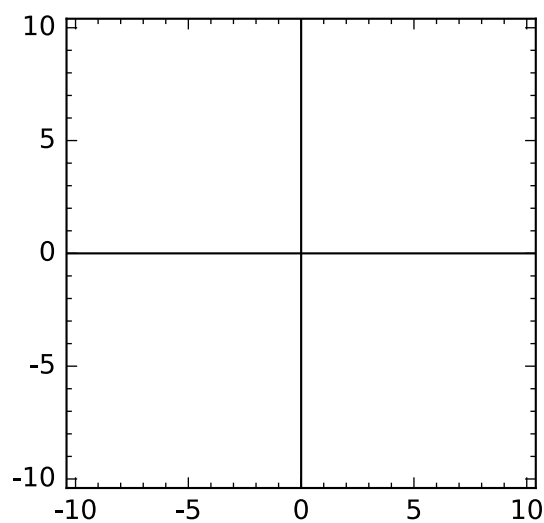
Simp(25, -20, 4, -30, 12, 9)

Genre : 0

Gamma : 29

Delta : 0

$$25x^2 - 20xy + 4y^2 - 30x + 12y + 9$$



$$29Y^2 - 6\sqrt{29}Y + 9$$

#co

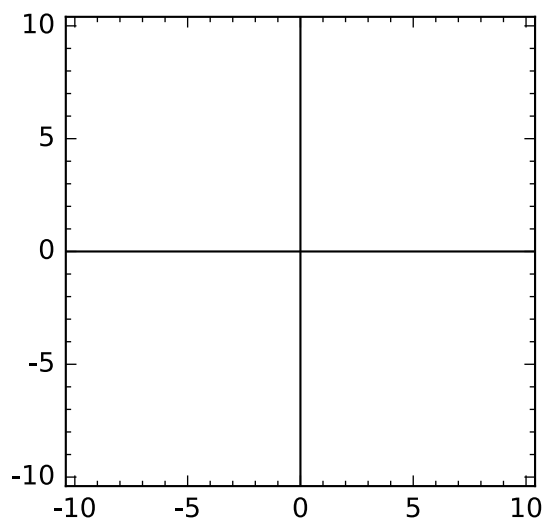
Simp (4, -12, 9, 12, -18, 34)

Genre : 0

Gamma : 13

Delta : 0

$$4x^2 - 12xy + 9y^2 + 12x - 18y + 34$$



$$13Y^2 + 6\sqrt{13}Y + 34$$

#cp

Simp (7, -10, 3, -7, 15, -42)

Genre : -4

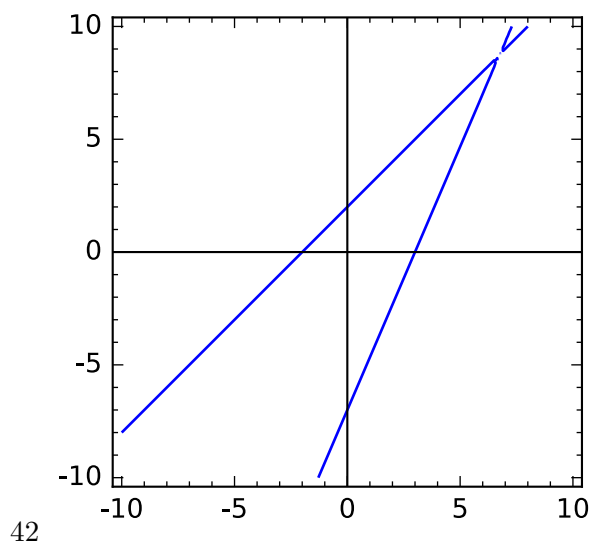
Gamma : 10

Delta : 0

$$7x^2 - 10xy + 3y^2 - 7x + 15y - 42$$

$$Y^2(\sqrt{29} + 5) - X^2(\sqrt{29} - 5) + X \left( \frac{3(\sqrt{29} + 2)}{\sqrt{\frac{1}{25}(\sqrt{29} + 2)^2 + 1}} - \frac{7}{\sqrt{\frac{1}{25}(\sqrt{29} + 2)^2 + 1}} \right) -$$

$$Y \left( \frac{3(\sqrt{29} - 2)}{\sqrt{\frac{1}{25}(\sqrt{29} - 2)^2 + 1}} + \frac{7}{\sqrt{\frac{1}{25}(\sqrt{29} - 2)^2 + 1}} \right) -$$



#cq

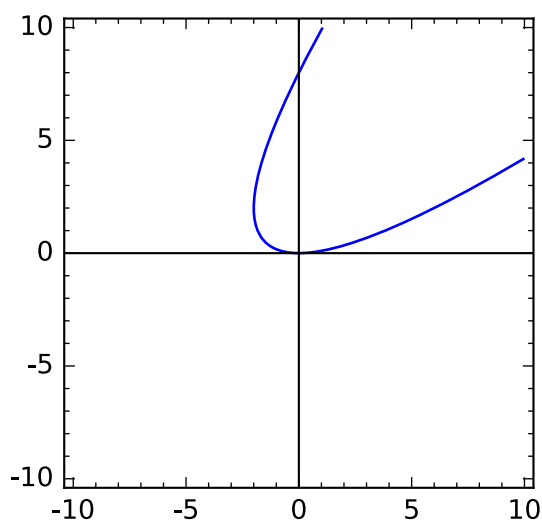
Simp (1, -2, 1, 0, -8, 0)

Genre : 0

Gamma : 2

Delta : -16

$$x^2 - 2xy + y^2 - 8y$$



$$2Y^2 - 4\sqrt{2}X + 4\sqrt{2}Y$$

#cr

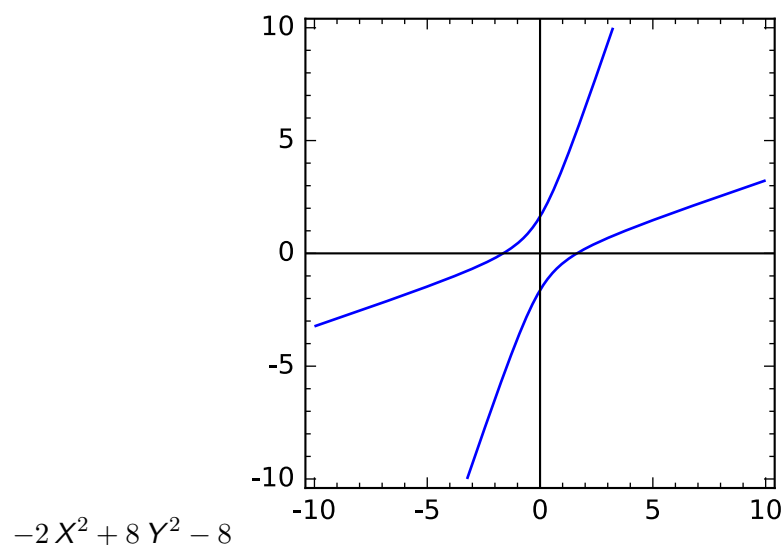
Simp (3, -10, 3, 0, 0, -8)

Genre : -16

Gamma : 6

Delta : 128

$$3x^2 - 10xy + 3y^2 - 8$$



#cs

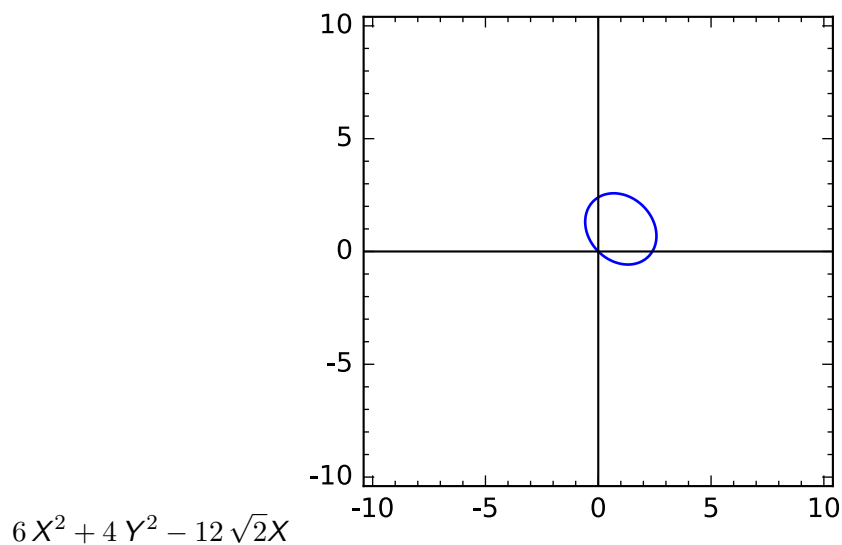
Simp (5, 2, 5, -12, -12, 0)

Genre : 24

Gamma : 10

Delta : -288

$5x^2 + 2xy + 5y^2 - 12x - 12y$



#ct

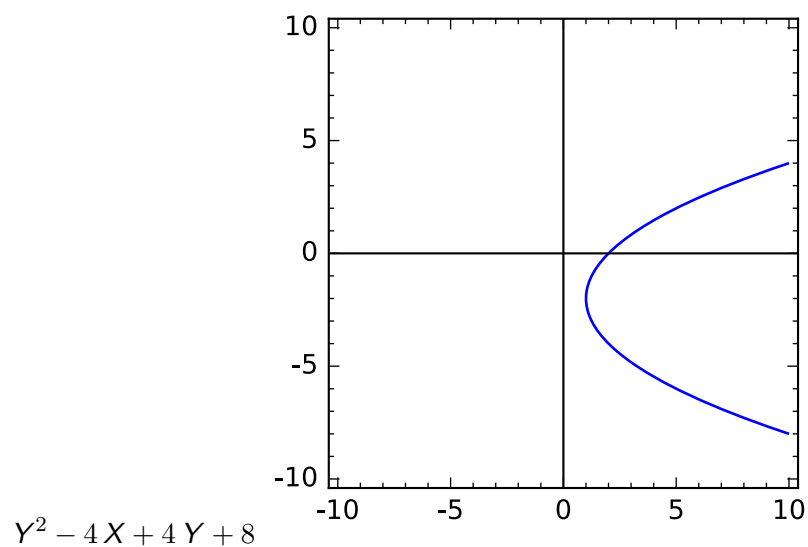
Simp (0, 0, 1, -4, 4, 8)

Genre : 0

Gamma : 1

Delta : -4

$y^2 - 4x + 4y + 8$



#cu

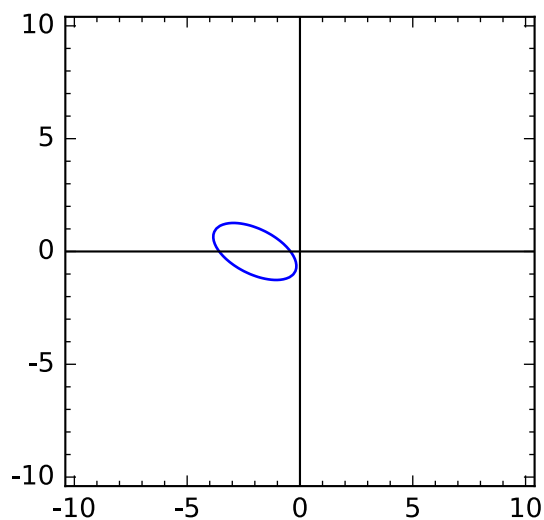
Simp (8, 12, 17, 32, 24, 12)

Genre : 100

Gamma : 25

Delta : -2000

$8x^2 + 12xy + 17y^2 + 32x + 24y + 12$



$5X^2 + 20Y^2 + 8\sqrt{5}X + 16\sqrt{5}Y + 12$

#cv

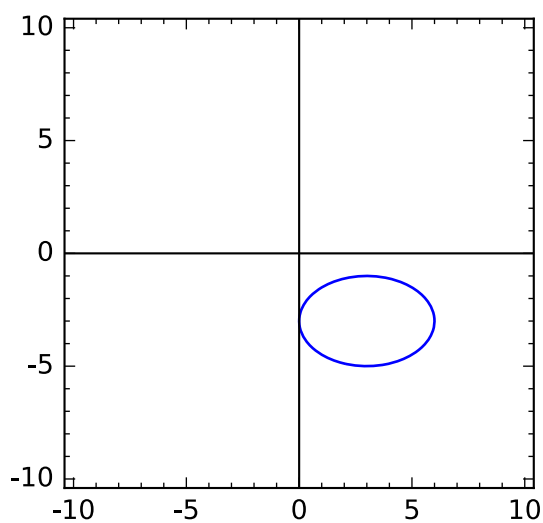
Simp (4, 0, 9, -24, 54, 81)

Genre : 36

Gamma : 13

Delta : -1296

$4x^2 + 9y^2 - 24x + 54y + 81$



$$4X^2 + 9Y^2 - 24X + 54Y + 81$$

#cw

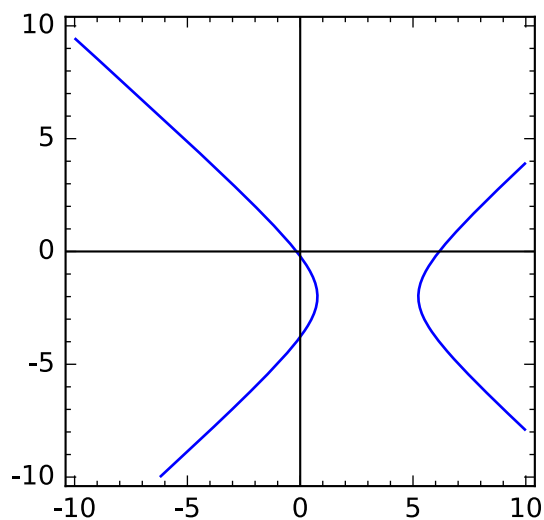
Simp (4, 0, -5, -24, -20, -4)

Genre : -20

Gamma : -1

Delta : 400

$$4x^2 - 5y^2 - 24x - 20y - 4$$



$$-5X^2 + 4Y^2 - 20X - 24Y - 4$$

#cx

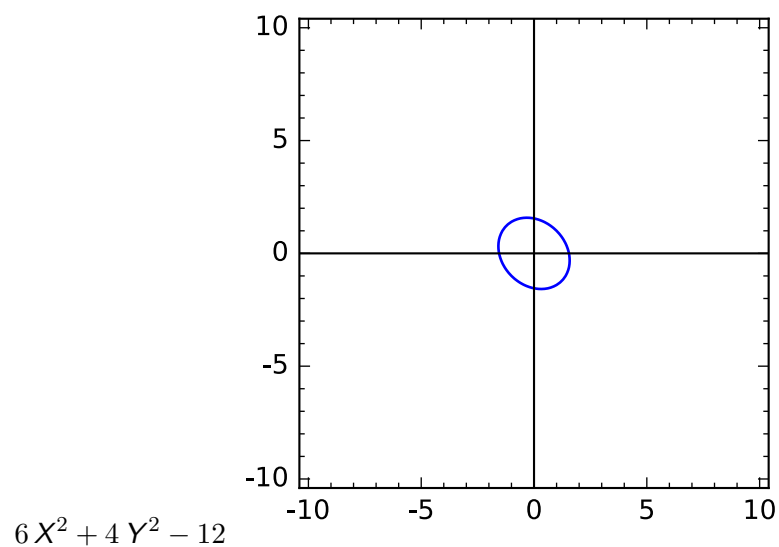
Simp (5, 2, 5, 0, 0, -12)

Genre : 24

Gamma : 10

Delta : -288

$$5x^2 + 2xy + 5y^2 - 12$$



#cy

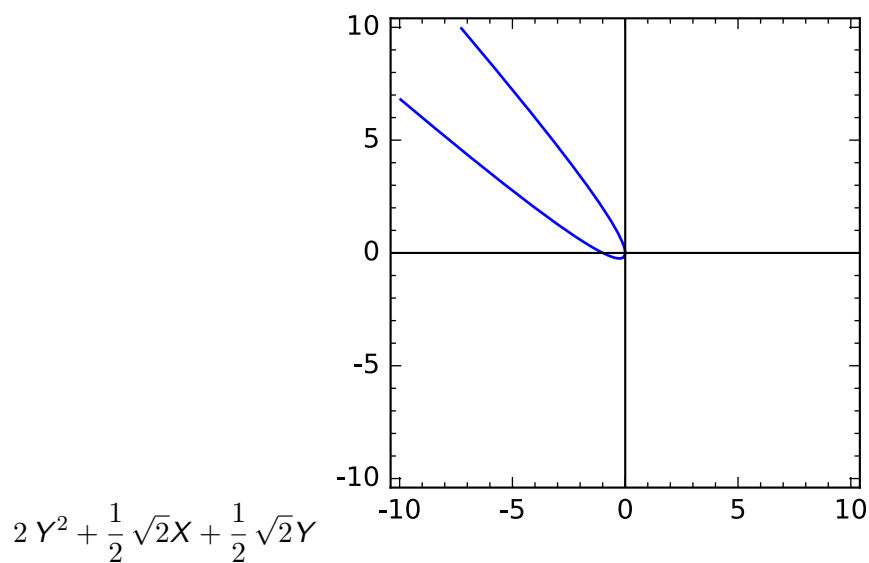
Simp(1, 2, 1, 1, 0, 0)

Genre : 0

Gamma : 2

Delta :  $-\frac{1}{4}$

$x^2 + 2xy + y^2 + x$



#cz

Simp(1, -16, -11, 10, 10, -7)

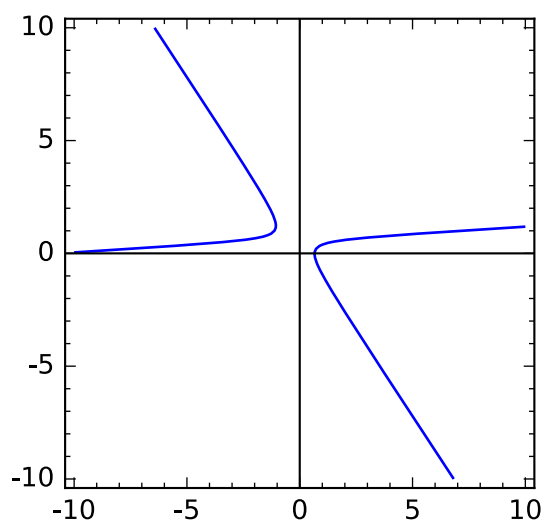
Genre : -75

Gamma : -10

Delta : 375

$x^2 - 16xy - 11y^2 + 10x + 10y - 7$





$$-15X^2 + 5Y^2 + 6\sqrt{5}X + 2\sqrt{5}Y - 7$$

#da

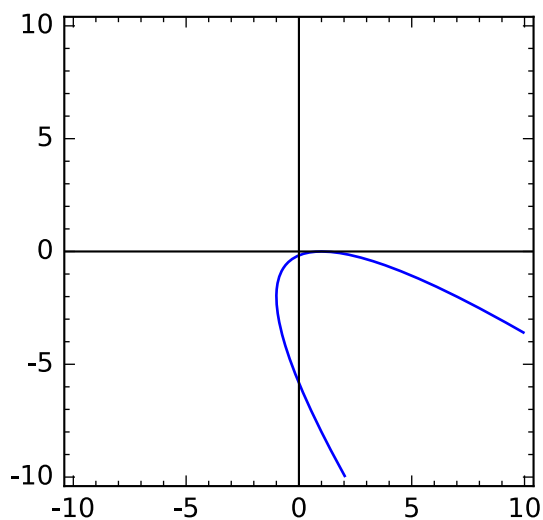
Simp (1, 2, 1, -2, 6, 1)

Genre : 0

Gamma : 2

Delta : -16

$$x^2 + 2xy + y^2 - 2x + 6y + 1$$



$$2Y^2 - 4\sqrt{2}X + 2\sqrt{2}Y + 1$$

#db

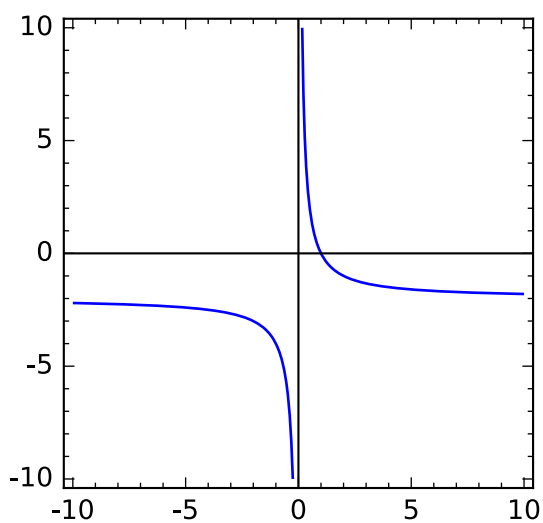
Simp (0, 1, 0, 2, 0, -2)

Genre :  $-\frac{1}{4}$

Gamma : 0

Delta :  $\frac{1}{2}$

$$xy + 2x - 2$$



$$-\frac{1}{2}X^2 + \frac{1}{2}Y^2 + \sqrt{2}X + \sqrt{2}Y - 2$$

#dc

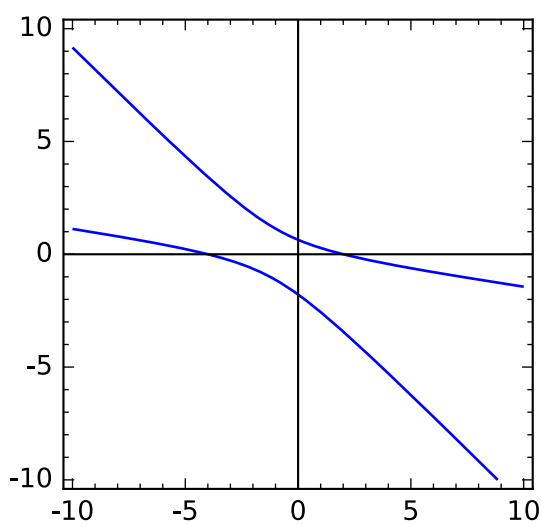
Simp(1, 8, 7, 2, 8, -8)

Genre : -9

Gamma : 8

Delta : 81

$$x^2 + 8xy + 7y^2 + 2x + 8y - 8$$



$$9X^2 - Y^2 + \frac{18}{5}\sqrt{5}X - \frac{4}{5}\sqrt{5}Y - 8$$

#dd

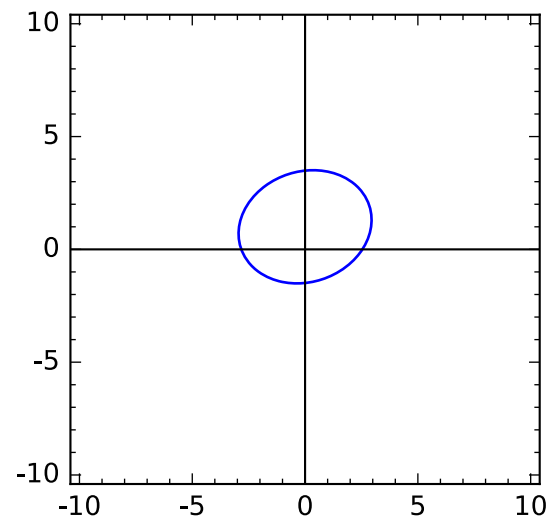
Simp(21, -6, 29, 6, -58, -151)

Genre : 600

Gamma : 50

Delta : -108000

$$21x^2 - 6xy + 29y^2 + 6x - 58y - 151$$



$$30X^2 + 20Y^2 + 18\sqrt{10}X - 4\sqrt{10}Y - 151$$

#de

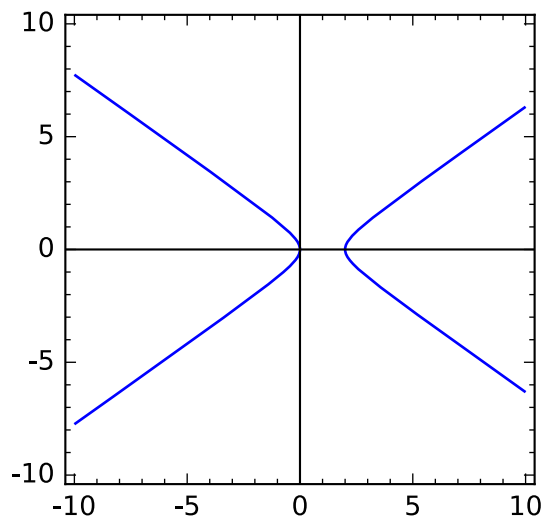
Simp (1, 0, -2, -2, 0, 0)

Genre : -2

Gamma : -1

Delta : 2

$$x^2 - 2y^2 - 2x$$



$$-2X^2 + Y^2 - 2Y$$

#df

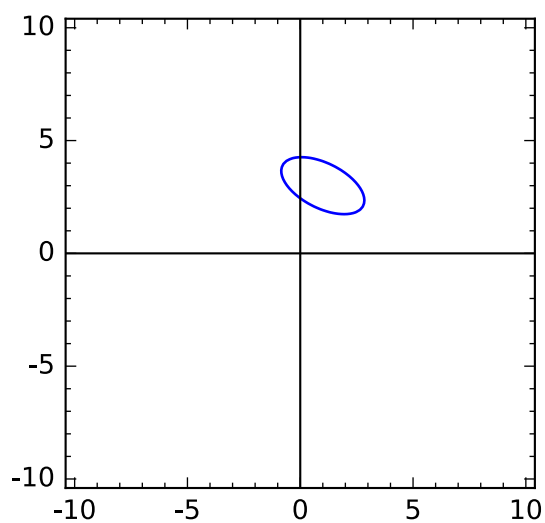
Simp (8, 12, 17, -52, -114, 177)

Genre : 100

Gamma : 25

Delta : -2000

$$8x^2 + 12xy + 17y^2 - 52x - 114y + 177$$



$$5X^2 + 20Y^2 + 2\sqrt{5}X - 56\sqrt{5}Y + 177$$

#dg

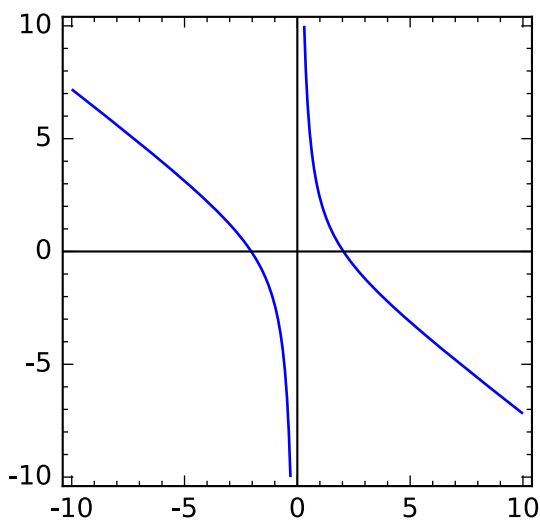
Simp (6, 8, 0, 0, 0, -25)

Genre : -16

Gamma : 6

Delta : 400

$$6x^2 + 8xy - 25$$



$$-2X^2 + 8Y^2 - 25$$

#dh

Simp (1, 2, -1, -9, 6, -5)

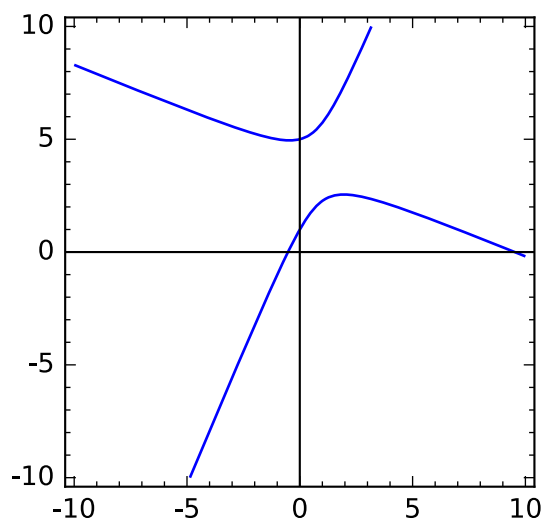
Genre : -2

Gamma : 0

Delta :  $-\frac{23}{4}$

$$x^2 + 2xy - y^2 - 9x + 6y - 5$$

$$-\sqrt{2}X^2 + \sqrt{2}Y^2 - 3X \left( \frac{2(\sqrt{2}+1)}{\sqrt{(\sqrt{2}+1)^2+1}} + \frac{3}{\sqrt{(\sqrt{2}+1)^2+1}} \right) +$$



$$3Y \left( \frac{2(\sqrt{2}-1)}{\sqrt{(\sqrt{2}-1)^2+1}} - \frac{3}{\sqrt{(\sqrt{2}-1)^2+1}} \right) - 5$$

#di

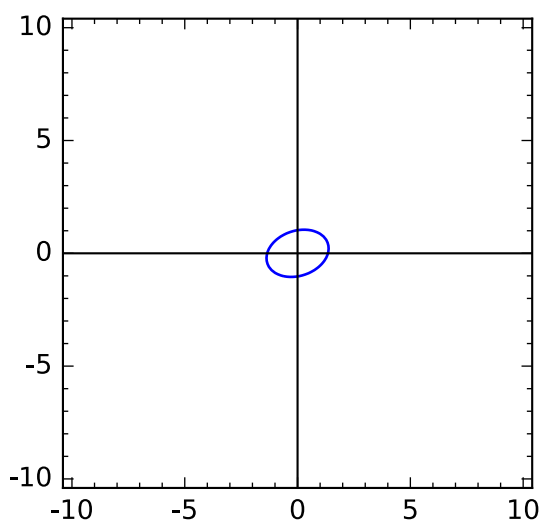
Simp(11, -6, 19, 0, 0, -20)

Genre : 200

Gamma : 30

Delta : -4000

$11x^2 - 6xy + 19y^2 - 20$



$$10X^2 + 20Y^2 - 20$$

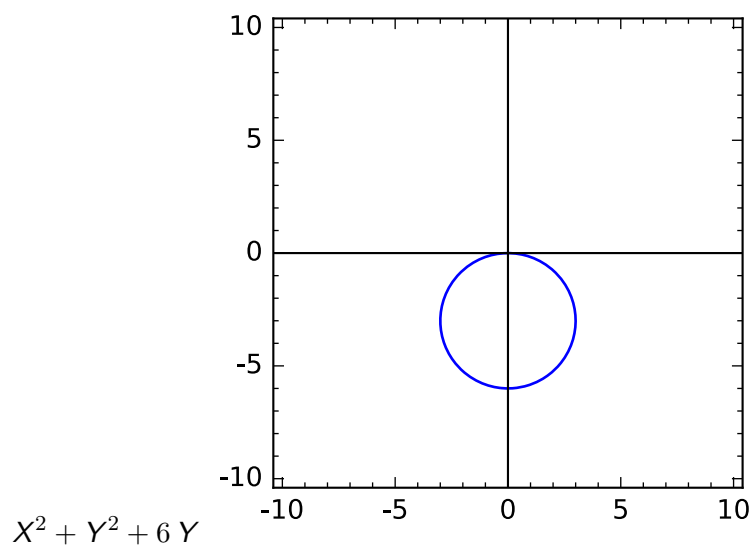
#dj

Simp(1, 0, 1, 0, 6, 0)

Genre : 1

Gamma : 2

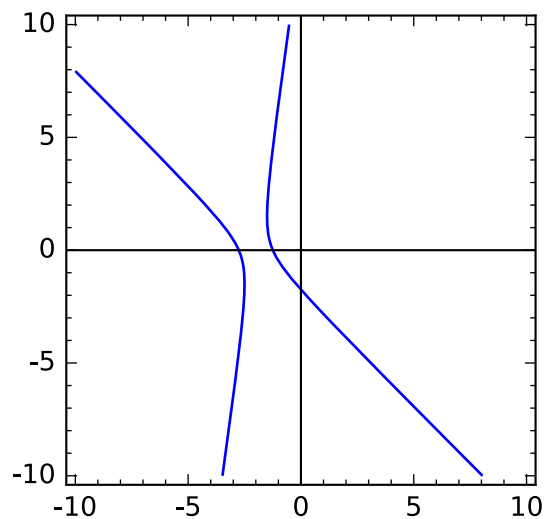
Delta :  $-9$   
 $x^2 + y^2 + 6y$



#dk

Simp(7, 6, -1, 28, 12, 24)

Genre :  $-16$   
 Gamma : 6  
 Delta : 64  
 $7x^2 + 6xy - y^2 + 28x + 12y + 24$

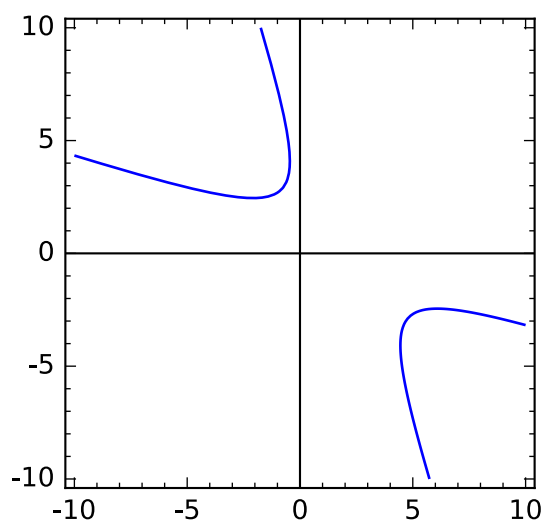


$$-2X^2 + 8Y^2 - \frac{4}{5}\sqrt{10}X + \frac{48}{5}\sqrt{10}Y + 24$$

#dl

Simp(3, 10, 3, -12, -20, 44)

Genre :  $-16$   
 Gamma : 6  
 Delta :  $-512$   
 $3x^2 + 10xy + 3y^2 - 12x - 20y + 44$



$$-2X^2 + 8Y^2 + 4\sqrt{2}X - 16\sqrt{2}Y + 44$$

#dm

Simp (3, -5, -2, 21, 7, 0)

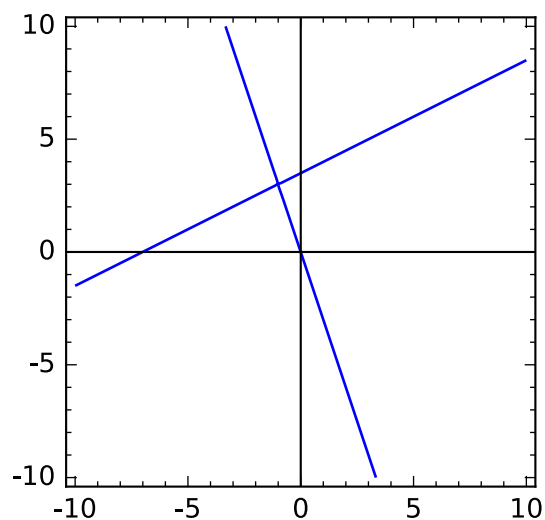
Genre :  $-\frac{49}{4}$

Gamma : 1

Delta : 0

$$3x^2 - 5xy - 2y^2 + 21x + 7y$$

$$\frac{1}{2}Y^2(5\sqrt{2}+1) - \frac{1}{2}X^2(5\sqrt{2}-1) + 7X\left(\frac{\sqrt{2}+1}{\sqrt{(\sqrt{2}+1)^2+1}} + \frac{3}{\sqrt{(\sqrt{2}+1)^2+1}}\right) -$$



$$7Y\left(\frac{\sqrt{2}-1}{\sqrt{(\sqrt{2}-1)^2+1}} - \frac{3}{\sqrt{(\sqrt{2}-1)^2+1}}\right)$$

#do

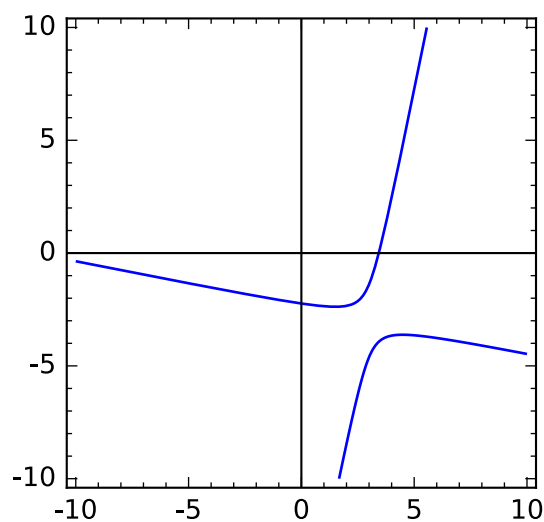
Simp (5, 24, -5, 42, -102, -203)

Genre : -169

Gamma : 0

Delta :  $-2197$

$$5x^2 + 24xy - 5y^2 + 42x - 102y - 203$$



$$-13X^2 + 13Y^2 + 30\sqrt{13}X - 6\sqrt{13}Y - 203$$

#dp

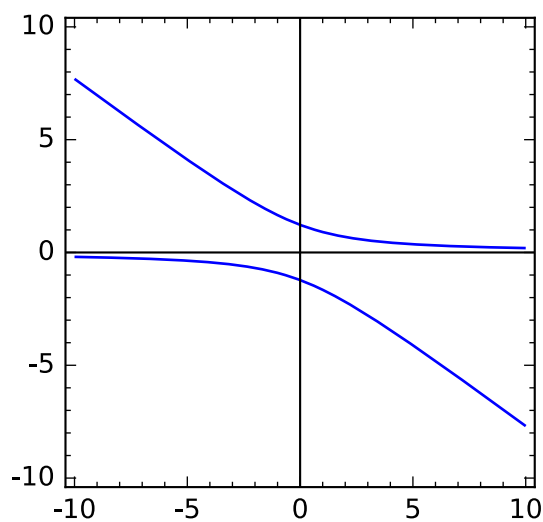
Simp(0, 3, 4, 0, 0, -6)

Genre :  $-\frac{9}{4}$

Gamma :  $\frac{4}{4}$

Delta :  $\frac{27}{2}$

$$3xy + 4y^2 - 6$$



$$\frac{9}{2}X^2 - \frac{1}{2}Y^2 - 6$$

#dq

Simp(5, 0, 2, 0, -16, 22)

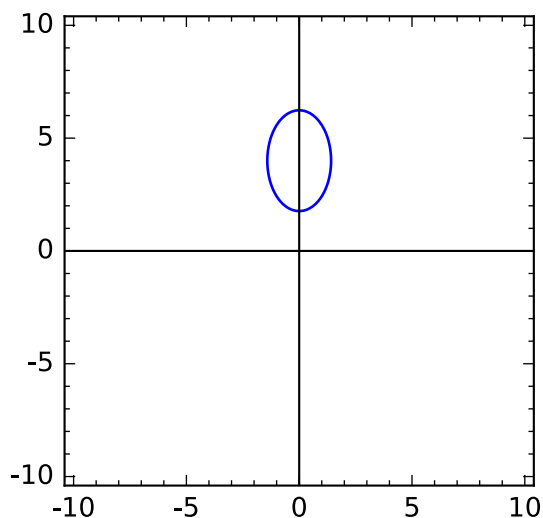
Genre : 10

Gamma : 7

Delta :  $-100$



$$5x^2 + 2y^2 - 16y + 22$$



$$2X^2 + 5Y^2 - 16X + 22$$

#dr

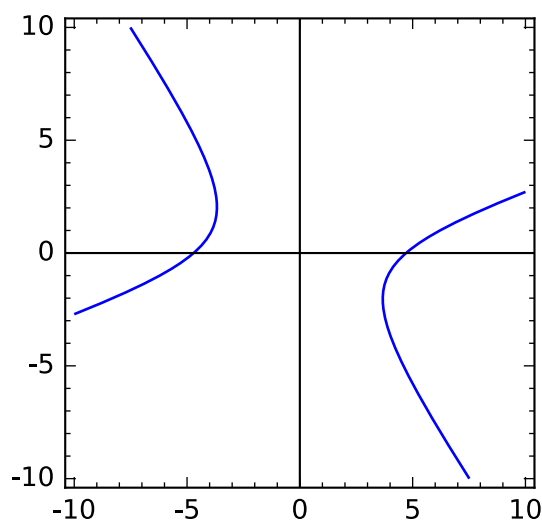
Simp(13, -30, -27, 0, 0, -288)

Genre : -576

Gamma : -14

Delta : 165888

$$13x^2 - 30xy - 27y^2 - 288$$



$$18X^2 - 32Y^2 - 288$$

#ds

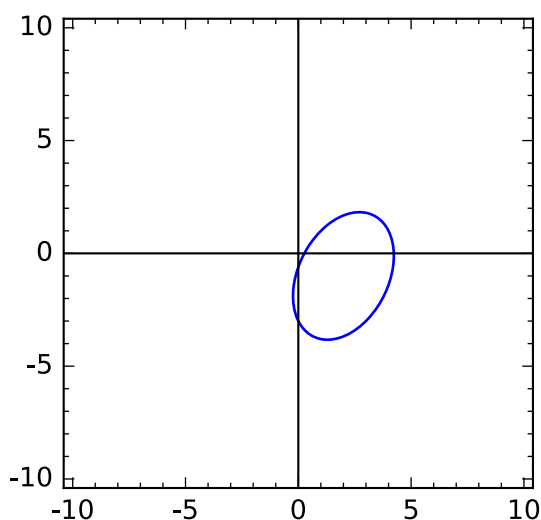
Simp(8, -4, 5, -36, 18, 9)

Genre : 36

Gamma : 13

Delta : -1296

$$8x^2 - 4xy + 5y^2 - 36x + 18y + 9$$



$$9X^2 + 4Y^2 - 18\sqrt{5}X + 9$$

#dt

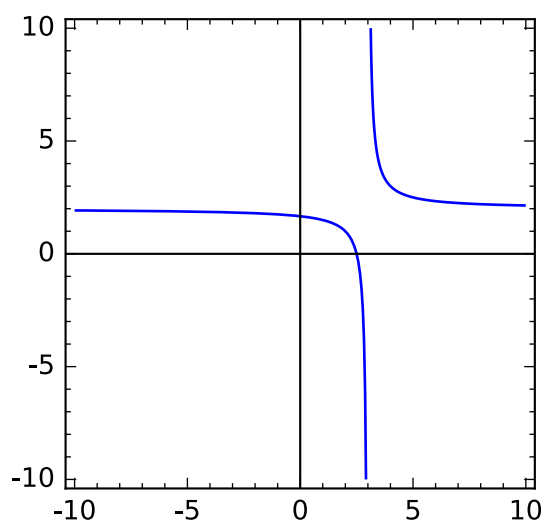
Simp (0, 1, 0, -2, -3, 5)

Genre :  $-\frac{1}{4}$

Gamma : 0

Delta :  $\frac{1}{4}$

$$xy - 2x - 3y + 5$$



$$-\frac{1}{2}X^2 + \frac{1}{2}Y^2 + \frac{1}{2}\sqrt{2}X - \frac{5}{2}\sqrt{2}Y + 5$$

#du

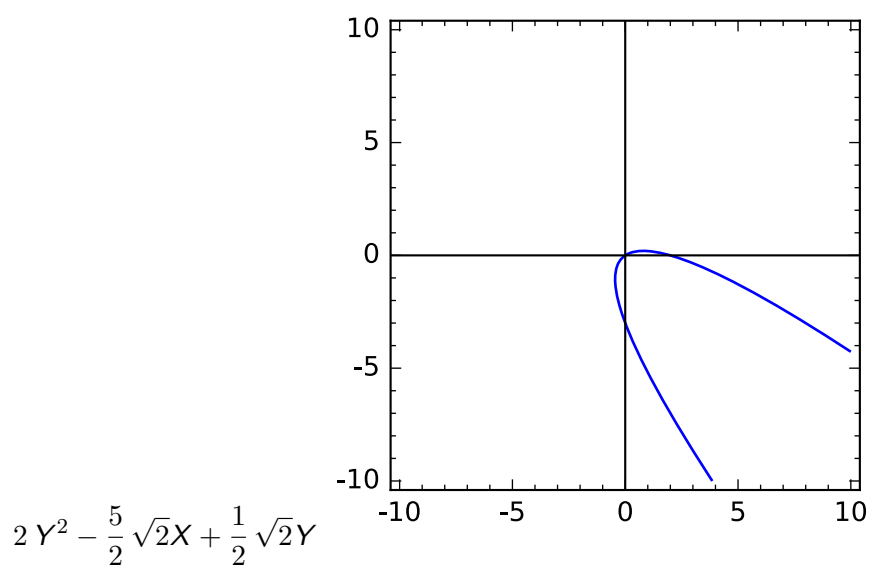
Simp (1, 2, 1, -2, 3, 0)

Genre : 0

Gamma :  $\frac{2}{25}$

Delta :  $-\frac{1}{4}$

$$x^2 + 2xy + y^2 - 2x + 3y$$



#dv

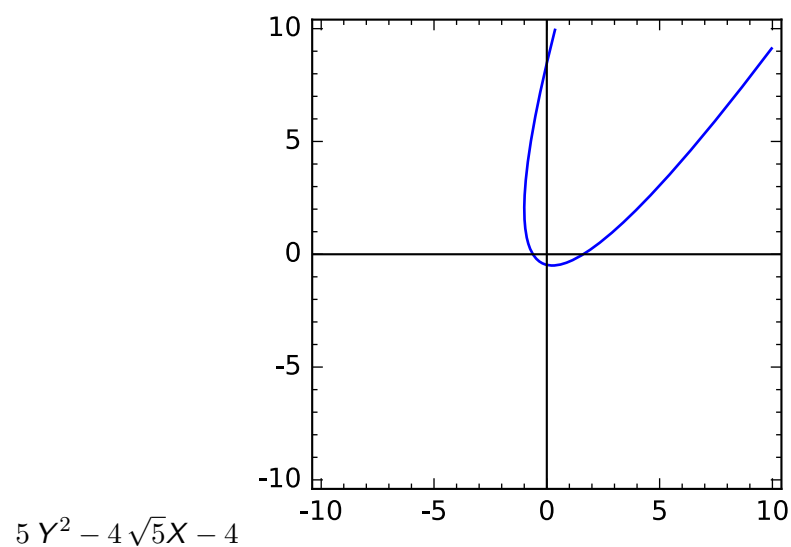
Simp(4, -4, 1, -4, -8, -4)

Genre : 0

Gamma : 5

Delta : -100

$$4x^2 - 4xy + y^2 - 4x - 8y - 4$$



#dw

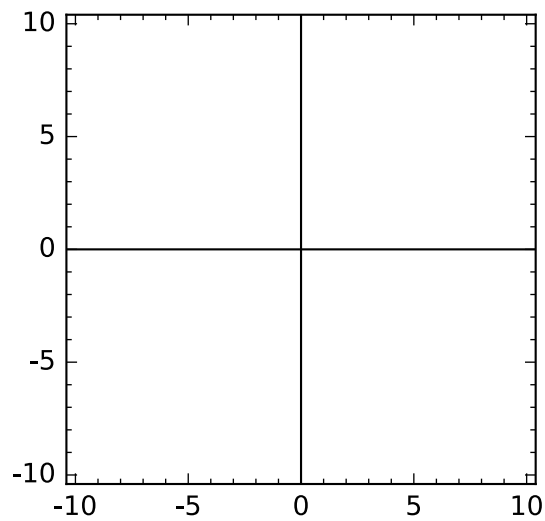
Simp(16, 24, 9, -68, 74, 1411)

Genre : 0

Gamma : 25

Delta : -62500

$$16x^2 + 24xy + 9y^2 - 68x + 74y + 1411$$



$$25 Y^2 - 100 X - 10 Y + 1411$$

#dx

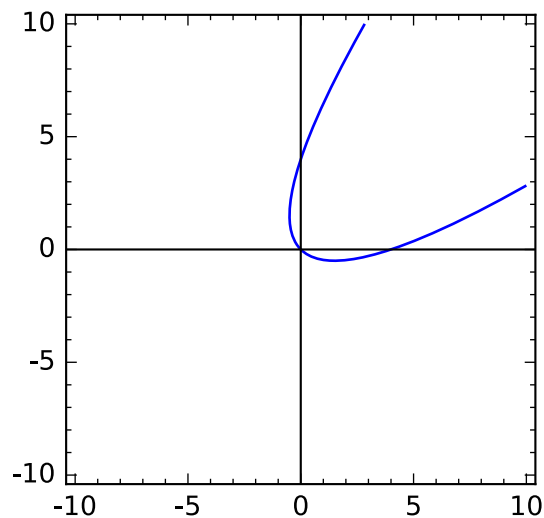
Simp (1, -2, 1, -4, -4, 0)

Genre : 0

Gamma : 2

Delta : -16

$$x^2 - 2xy + y^2 - 4x - 4y$$



$$2 Y^2 - 4 \sqrt{2} X$$

#dy

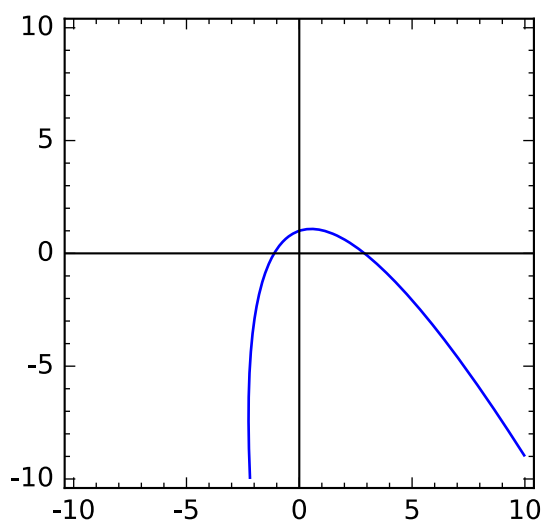
Simp (9, 6, 1, -16, 28, -29)

Genre : 0

Gamma : 10

Delta : -2500

$$9x^2 + 6xy + y^2 - 16x + 28y - 29$$



$$10 Y^2 - 10 \sqrt{10} X - 2 \sqrt{10} Y - 29$$

#dz

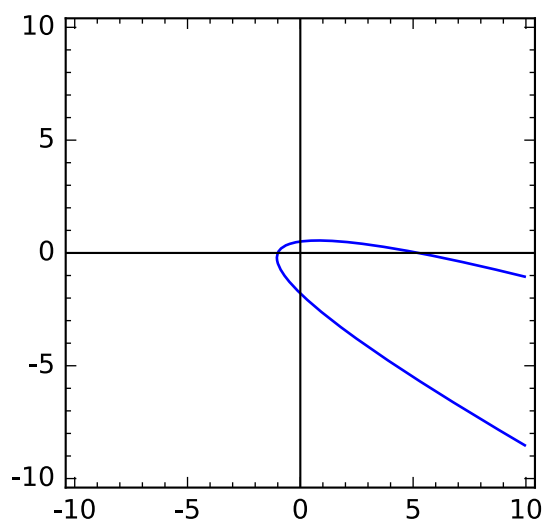
Simp(25, 120, 144, -106, 185, -131)

Genre : 0

Gamma : 169

Delta :  $-\frac{4826809}{4}$

$$25 x^2 + 120 xy + 144 y^2 - 106 x + 185 y - 131$$



$$169 Y^2 - 169 X + 130 Y - 131$$

#ea

Simp(9, 24, 16, -2, -39, -11)

Genre : 0

Gamma : 25

Delta :  $-\frac{11881}{4}$

$$9 x^2 + 24 xy + 16 y^2 - 2 x - 39 y - 11$$

$$25 Y^2 + \frac{109}{5} X - \frac{162}{5} Y - 11$$

