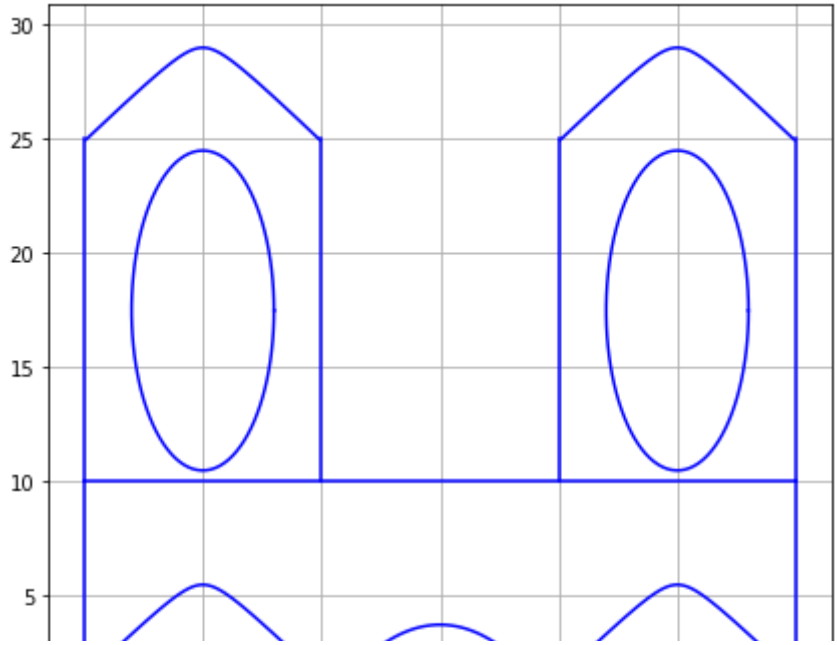
```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline


def rostoGAnime():
  x1 = np.linspace(-15, 15, 100)
  y1 = np.linspace(-10, -10, 100)
  plt.plot(x1, y1, 'b')

  x2 = np.linspace(-15, -15, 100)
  y2 = np.linspace(-10, 10, 100)
  plt.plot(x2, y2, 'b')

  x3 = np.linspace(-15, 15, 100)
  y3 = np.linspace(10, 10, 100)
  plt.plot(x3, y3, 'b')

  x4 = np.linspace(15, 15, 100)
  y4 = np.linspace(10, -10, 100)
  plt.plot(x4, y4, 'b')

def bocaGAnime():
  x1 = np.linspace(-5, -5, 100)
  y1 = np.linspace(-10, 0, 100)
  plt.plot(x1, y1, 'b')

  x2 = np.linspace(5, 5, 100)
  y2 = np.linspace(-10, 0, 100)
  plt.plot(x2, y2, 'b')

  t = np.linspace(-5, 5, 100)
  xc, yc = 0, 3.75
  a = -0.147

  x = t
  y = a * (t - xc) ** 2 + yc
  plt.plot(x, y, 'b')

def olhosGAnime():
  t = np.linspace(-2, 2, 100)
  xc, yc = -10, 6.50
  a = 1
  b = 1

  x_dir = a * np.sinh(t) + xc
  x_esq = -x_dir
  y = -b * np.cosh(t) + yc
  plt.plot(x_dir, y, 'b')
  plt.plot(x_esq, y, 'b')

def orelhasGAnime():
  x1 = np.linspace(-15, -15, 100)
  y = np.linspace(10, 25, 100)
```

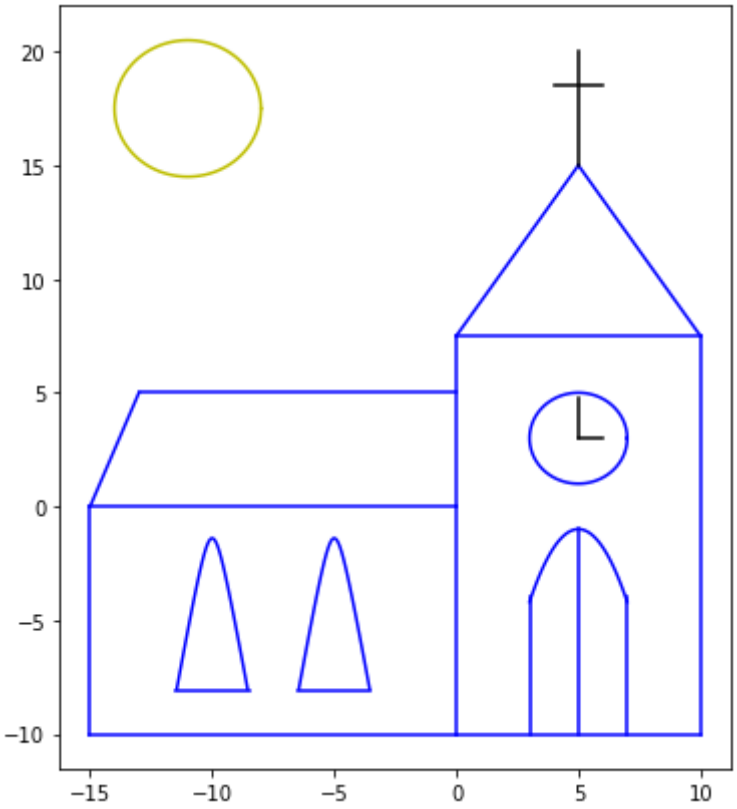
```
    plt.plot(x1, y, 'b')

    x2 = np.linspace(-5, -5, 100)
    plt.plot(x2, y, 'b')

    x3 = -x1
    plt.plot(x3, y, 'b')

    x4 = -x2
    plt.plot(x4, y, 'b')

    t = np.linspace(-2.3, 2.3, 100)
    xc, yc = -10, 30
    a = 1
    b = 1

    x_dir = a * np.sinh(t) + xc
    x_esq = -x_dir
    y = -b * np.cosh(t) + yc
    plt.plot(x_dir, y, 'b')
    plt.plot(x_esq, y, 'b')

    #parte interna
    t2 = np.linspace(0, 2 * np.pi, 100)
    xc, yc = -10, 17.5
    a = 3
    b = 7

    x = a * np.cos(t2) + xc
    y = b * np.sin(t2) + yc
    plt.plot(x, y, 'b')

    xc2 = -xc
    x2 = a * np.cos(t2) + xc2
    y2 = b * np.sin(t2) + yc
    plt.plot(x2, y2, 'b')

plt.figure(figsize=(7,9))
rostoGAnime()
bocaGAnime()
olhosGAnime()
orelhasGAnime()
plt.grid()
```




```
def parteLado():
  x1 = np.linspace(-15, 0, 100)
  y1 = np.linspace(-10, -10, 100)
  plt.plot(x1, y1, 'b')

  x2 = np.linspace(-15, -15, 100)
  y2 = np.linspace(-10, 0, 100)
  plt.plot(x2, y2, 'b')

  x3 = np.linspace(-15, 0, 100)
  y3 = np.linspace(0, 0, 100)
  plt.plot(x3, y3, 'b')

  x4 = np.linspace(0, 0, 100)
  y4 = np.linspace(0, -10, 100)
  plt.plot(x4, y4, 'b')

  x5 = np.linspace(0, 10, 100)
  y5 = np.linspace(-10, -10, 100)
  plt.plot(x5, y5, 'b')

  x6 = np.linspace(10, 10, 100)
  y6 = np.linspace(-10, 7.5, 100)
  plt.plot(x6, y6, 'b')

  x7 = np.linspace(0, 0, 100)
  y7 = np.linspace(0, 7.5, 100)
  plt.plot(x7, y7, 'b')

  x8 = np.linspace(0, 10, 100)
  y8 = np.linspace(7.5, 7.5, 100)
  plt.plot(x8, y8, 'b')

def telhadosIgreja():
  x = np.linspace(-13, 0, 100)
  y = np.linspace(5, 5, 100)
  plt.plot(x, y, 'b')
```

```
    x2 = np.linspace(-15, -13, 100)
    y2 = np.linspace(0, 5, 100)
    plt.plot(x2, y2, 'b')

    x3 = np.linspace(0, 5, 100)
    y3 = np.linspace(7.5, 15, 100)
    plt.plot(x3, y3, 'b')

    x4 = np.linspace(5, 10, 100)
    y4 = np.linspace(15, 7.5, 100)
    plt.plot(x4, y4, 'b')

  def cruzIgreja():
    x1 = np.linspace(5, 5, 100)
    y1 = np.linspace(15, 20, 100)
    plt.plot(x1, y1, 'k')

    x2 = np.linspace(4, 6, 100)
    y2 = np.linspace(18.5, 18.5, 100)
    plt.plot(x2, y2, 'k')

  def portaIgreja():
    x1 = np.linspace(3, 3, 100)
    y1 = np.linspace(-10, -4, 100)
    plt.plot(x1, y1, 'b')

    x2 = np.linspace(7, 7, 100)
    y2 = np.linspace(-10, -4, 100)
    plt.plot(x2, y2, 'b')

    x3 = np.linspace(5, 5, 100)
    y3 = np.linspace(-10, -1, 100)
    plt.plot(x3, y3, 'b')

    #Parábola
    t = np.linspace(3, 7, 100)
    xc, yc = 5, -1
    a = -0.8

    x = t
    y = a * (t - xc) ** 2 + yc
    plt.plot(x, y, 'b')

  def relogioIgreja():
    #Círculo
    t = np.linspace(0, 2 * np.pi, 100)
    xc, yc = 5, 3

    r = 2
    x = r * np.cos(t) + xc
    y = r * np.sin(t) + yc
    plt.plot(x, y, 'b')

    x1 = np.linspace(xc, xc, 100)
```

```
    y1 = np.linspace(yc, 4.75, 100)
    plt.plot(x1, y1, 'k')

    x2 = np.linspace(xc, 6, 100)
    y2 = np.linspace(yc, yc, 100)
    plt.plot(x2, y2, 'k')

  def janelasIgreja():
    #Hipérbole
    t = np.linspace(-2, 2, 100)
    xc, yc = -10, 1
    a = 0.4
    b = 2.4

    x_dir = a * np.sinh(t) + xc
    y = -b * np.cosh(t) + yc
    plt.plot(x_dir, y, 'b')

    t = np.linspace(-2, 2, 100)
    xc2, yc2 = -5, 1

    x_esq = a * np.sinh(t) + xc2
    y2 = -b * np.cosh(t) + yc2
    plt.plot(x_esq, y2, 'b')

    xBase1 = np.linspace(-11.5, -8.5, 100)
    yBase1 = np.linspace(-8.1, -8.1, 100)
    plt.plot(xBase1, yBase1, 'b')

    xBase2 = np.linspace(-6.5, -3.5, 100)
    yBase2 = np.linspace(-8.1, -8.1, 100)
    plt.plot(xBase2, yBase2, 'b')

  def solzin():

    t = np.linspace(0, 2 * np.pi, 100)
    xc, yc = -11, 17.5

    r = 3
    x = r * np.cos(t) + xc
    y = r * np.sin(t) + yc
    plt.plot(x, y, 'y')

  plt.figure(figsize=(6,7))
  parteLado()
  telhadosIgreja()
  cruzIgreja()
  portaIgreja()
  relogioIgreja()
  janelasIgreja()
  solzin()
```


20
15
10
5
0
−5
−10
−15
−10
−5
0
5
10