Łukasz Turowski TD_20A

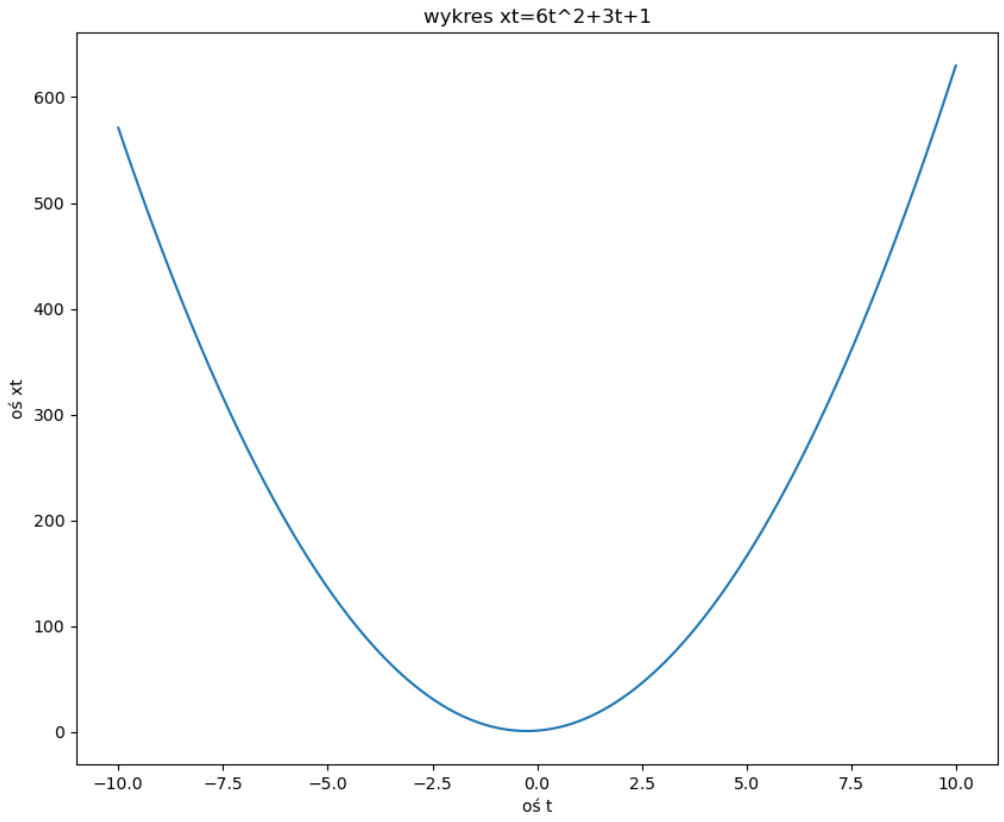
45136

Wykresy były robione funkcją pylab w pythonie.

Zad 1.

x=6t^2+3t+1

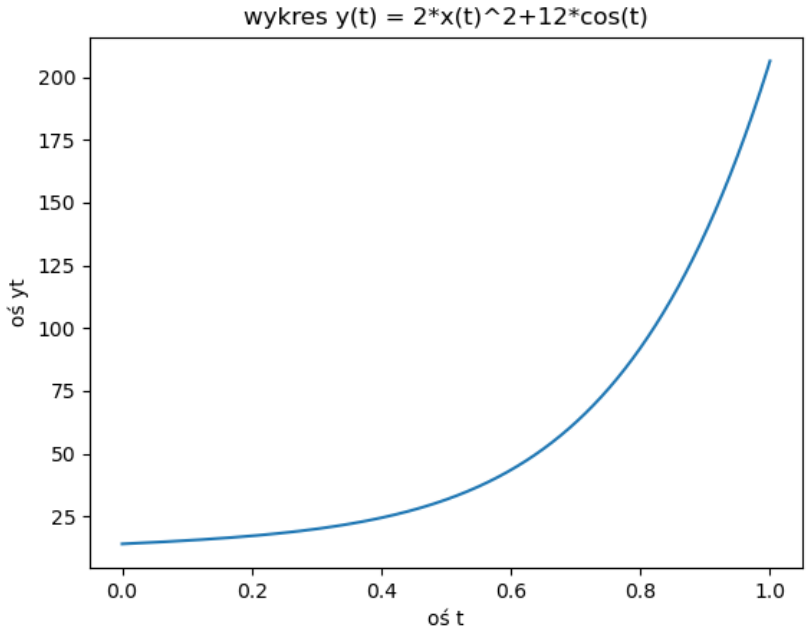
```
def funkcja(c, b, a):
    delta = b ** 2 - 4 * a * c
    if delta < 0:
        print("Brak miejsca zerowego")
    elif delta == 0:
        t1 = (-b) / (2 * a)
        print("Jest jedno miejsce zerowe:")
        print(t1)
    else:
        t1 = (-b + (math.sqrt(delta))) / (2 * a)
        t2 = (-b - (math.sqrt(delta))) / (2 * a)
        print("Sa dwa miejsca zerowe:")
        print(t1)
        print(t2)
    plt.figure(figsize=(10, 8), dpi=100)
    t = np.arange(-10, 10, 0.01)
    xt = a * t ** 2 + b * t + c
    plt.title('wykres xt=6t^2+3t+1')
```



Zad. 2 t=np.arange(0, 1, 1 / 22050)

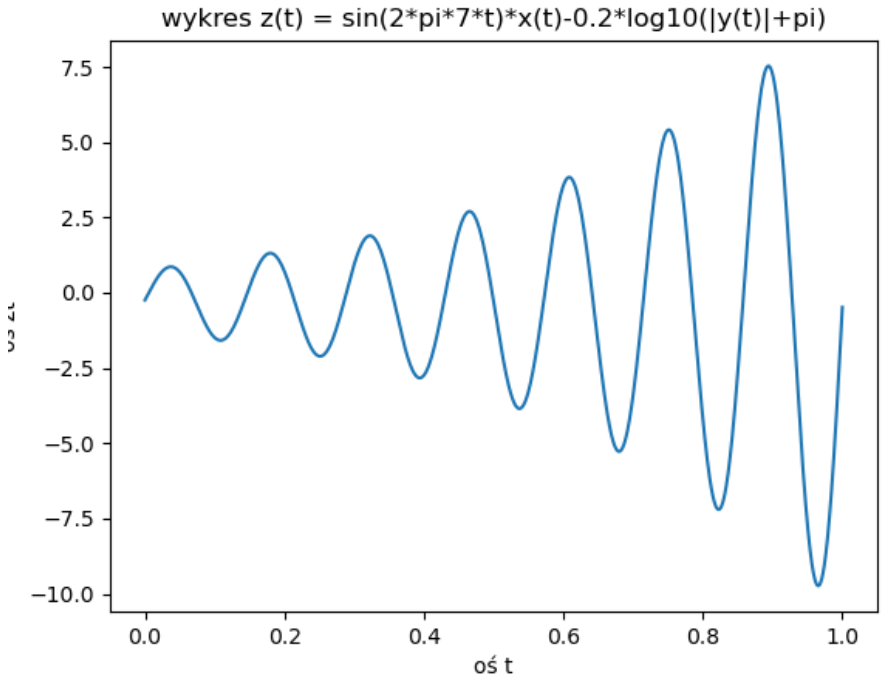
1) $y(t) = 2 \cdot x(t)^2 + 12 \cdot \cos(t)$

```
for i in range(np.size(t)):
    yt[i] = 2 * (x(t[i]) ** 2) + 12 * np.cos(t[i])
```



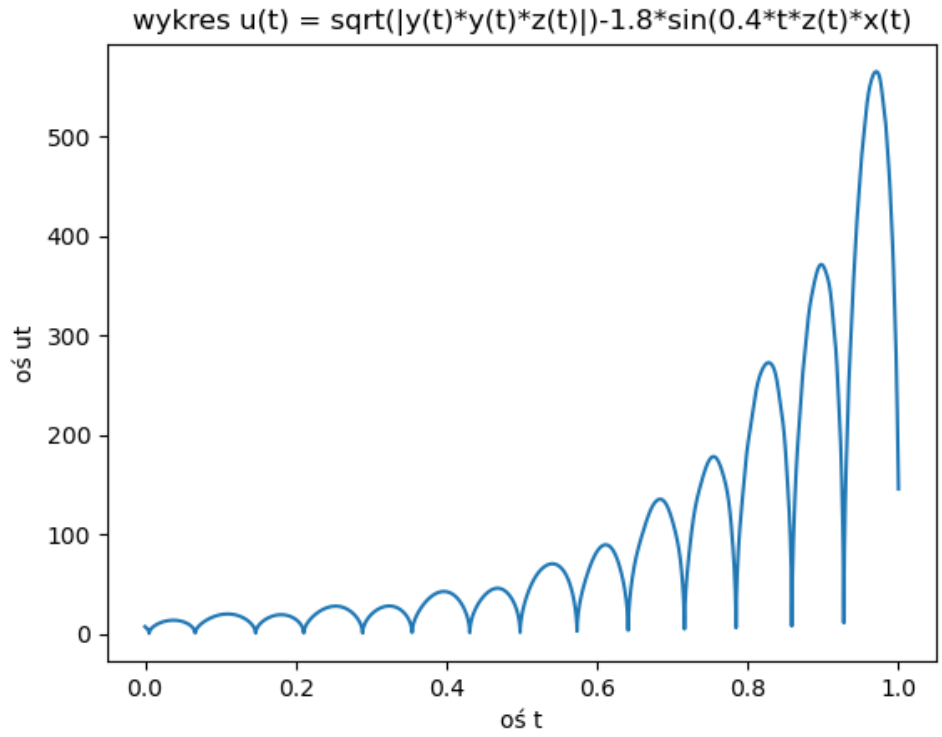
2) $z(t) = \sin(2\pi \cdot 7 \cdot t) \cdot x(t) - 0.2 \cdot \log_{10}(|y(t)| + \pi)$

```
for i in range(np.size(t)):
    zt[i] = np.sin(2 * np.pi * 7 * t[i]) * x(t[i]) - 0.2 * np.log10(abs(yt[i]) + np.pi)
```



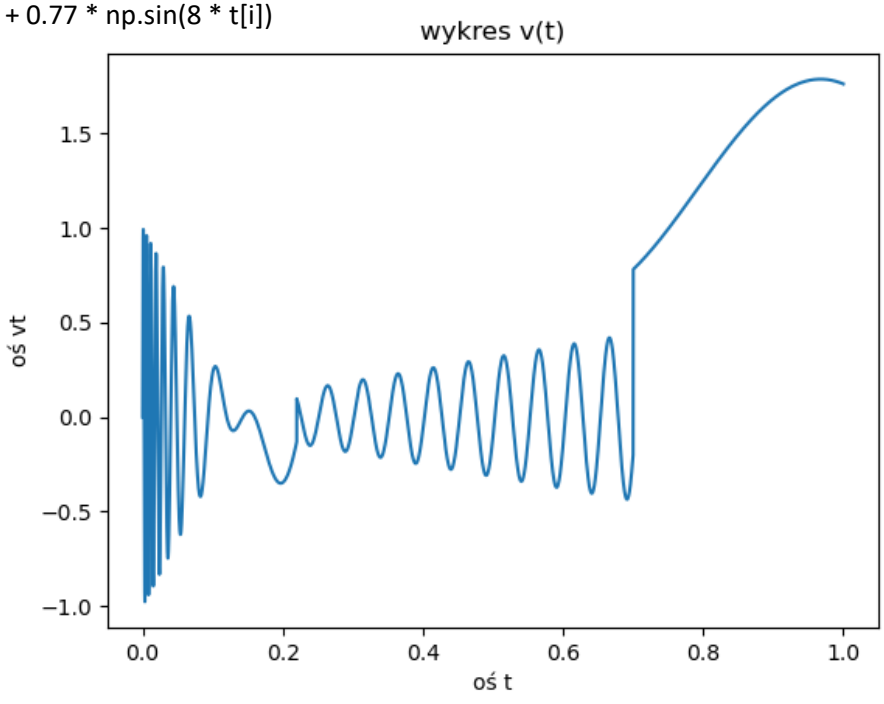
3) $u(t) = \sqrt{|y(t) \cdot y(t) \cdot z(t)|} - 1.8 \cdot \sin(0.4 \cdot t \cdot z(t) \cdot x(t))$

```
for i in range(np.size(t)):
    ut[i] = np.sqrt(abs(yt[i] * yt[i] * zt[i])) - 1.8 * np.sin(0.4 * t[i] * zt[i] * x(t[i]))
```



4) $$v(t) = \begin{cases} (1 - 7t) \cdot \sin(\frac{2\pi \cdot t \cdot 10}{t + 0.04}) & \text{dla } 0.22 > t \geq 0 \\ 0.63 \cdot t \cdot \sin(125 \cdot t) & \text{dla } 0.22 \leq t < 0.7 \\ t^{-0.662} + 0.77 \sin(8t) & \text{dla } 1.0 \geq t \geq 0.7 \end{cases}$$

```
for i in range(np.size(t)):
    if 0.22 > t[i] >= 0:
        vt[i] = (1 - 7 * t[i]) * np.sin((2 * np.pi * t[i] * 10) / (t[i] + 0.04))
    elif 0.22 <= t[i] < 0.7:
        vt[i] = 0.63 * t[i] * np.sin(125 * t[i])
    else:
        vt[i] = t[i] ** (-0.662) + 0.77 * np.sin(8 * t[i])
```

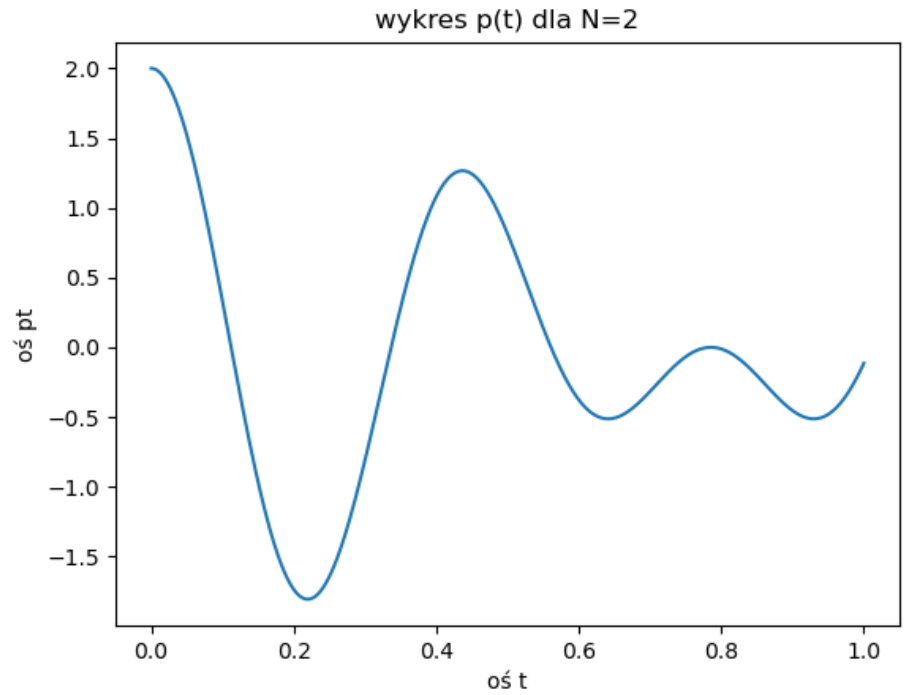


5) $$p(t) = \sum_{n=1}^{N} \frac{\cos(12t \cdot n^2) + \cos(16t \cdot n)}{n^2}$$

$$\text{dla } N \in \{2, 4, \widehat{A}\widehat{B}\}$$

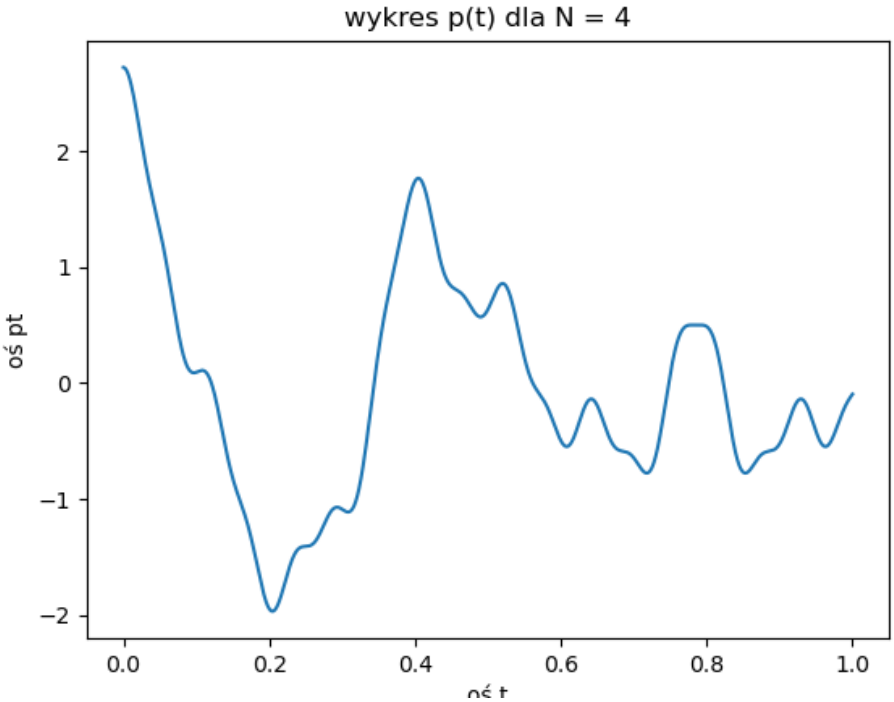
Dla N = 2:

```
for i in range(np.size(t)):
    for j in range(1, 2):
        pt[i] += (np.cos(12 * t[i] * j ** 2) + np.cos(16 * t[i] * j)) / j ** 2
```



Dla N = 4:

```
for i in range(np.size(t)):
    for j in range(1, 4):
        pt[i] += (np.cos(12 * t[i] * j ** 2) + np.cos(16 * t[i] * j)) / j ** 2
```



Dla N = 63:

```
for i in range(np.size(t)):
    for j in range(1, 63):
        pt[i] += (np.cos(12 * t[i] * j ** 2) + np.cos(16 * t[i] * j)) / j ** 2
```