

## 6. domaca zadaca

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V - volumen

$$c = p(0) + Y * s(0)$$

Y - omjer mase jedinke hrane i stanice

k - konstanta

p - koncentracija populacije

s - koncentracija hrane

$p(t) = V * c / (kY + c - p(t)) * (1 - p(t) / c) * p(t)$  - formula za rast s ogranicenim hranjivim sastojcima

$$y(x_0+h) = y(x_0) + h * y'(x_0)$$

In[380]:= **V = 4;**

In[381]:= **p[0] = 3000;**

In[382]:= **k = 40 000;**

In[383]:= **Y = 8;**

Prvi primjer (uzmimo interval od 2 dana)

In[384]:= **s[0] = 4000;**

$$c = p[0] + Y * s[0];$$

$$p_{derivirano}[x_] = (1 - p[x] / c) ((V * c) / (k * Y + c - p[x])) * p[x];$$

In[399]:= **p[2] = p[0] + 2 \* p\_{derivirano}[0]**

Out[400]= 5181.82

In[401]:= **p[4] = p[2] + 2 \* p\_{derivirano}[2]**

Out[402]= 8715.37

In[403]:= **p[6] = p[4] + 2 \* p\_{derivirano}[4]**

Out[404]= 14 007.7

In[405]:= **p[8] = p[6] + 2 \* p\_{derivirano}[6]**

Out[406]= 20 906.4

In[407]:= **p[10] = p[8] + 2 \* p\_{derivirano}[8]**

Out[408]= 27 961.9

In[397]:= **p[12] = p[10] + 2 \* p\_{derivirano}[10]**

Out[398]= 32 776.

In[393]:= **p[14] = p[12] + 2 \* p\_{derivirano}[12]**

Out[394]= 34 585.8

In[395]:= **p[16] = p[14] + 2 \* p\_{derivirano}[14]**

Out[396]= 34 943.5

Drugi primjer (uzmimo razmak od 4 dana)

In[419]:= **s[0] = 4000;**

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In[433]:= c = p[0] + Y * s[0];
In[432]:= pderivirano[x_] = (1 - p[x] / c) ((v * c) / (k * Y + c - p[x])) * p[x];
In[422]:= p[4] = p[0] + 4 * pderivirano[0]
Out[423]= 7363.64
In[424]:= p[8] = p[4] + 4 * pderivirano[4]
Out[425]= 16729.9
In[426]:= p[12] = p[8] + 4 * pderivirano[8]
Out[427]= 31187.4
In[428]:= p[16] = p[12] + 4 * pderivirano[12]
Out[429]= 37062.7
In[430]:= p[20] = p[16] + 4 * pderivirano[16]
Out[431]= 33215.5
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Treci primjer (uzmimo razmak od 8 dana)

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In[434]:= s[0] = 4000;
In[437]:= c = p[0] + Y * s[0];
In[438]:= pderivirano[x_] = (1 - p[x] / c) ((v * c) / (k * Y + c - p[x])) * p[x];
In[439]:= p[8] = p[0] + 8 * pderivirano[0]
Out[440]= 11727.3
In[441]:= p[16] = p[8] + 8 * pderivirano[8]
Out[442]= 37169.5
In[443]:= p[24] = p[16] + 8 * pderivirano[16]
Out[444]= 29050.6
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Zakljucak: sto veci razmak u vremenu uzmemu to je vece odstupanje