

> #Please do not post homework  
#Shreya Ghosh, 10-25-2021

> read "/Users/shreyaghosh/Documents/M15.txt"

> Help15( )

*HW3(u,v,w), HW2(u,v), Dis1(F,y,y0,h,A), ToSys(k,z,f,INI)* (1)

> #2ii.

$ToSys\left(4, z, \frac{z[1] + 2 \cdot z[2] + 3 \cdot z[3] + 11 \cdot z[4]}{z[1] + z[3]}, [1, 5, 5, 2]\right)$   
 $\left[\frac{z_1 + 2z_2 + 3z_3 + 11z_4}{z_1 + z_3}, z_1, z_2, z_3\right]$  (2)

> Help13( )

*RT2(x,y,d,K), Orb2(F,x,y,pt0,K1,K2), FP2(F,x,y), SFP2(F,x,y), PlotOrb2(L), FP2drz(F,x,y), SFP2drz(F,x,y)* (3)

> #3.

*Orbk(2, z, (1 - z[1]) \cdot (1 - z[2]), [2.5, 2.7], 1000, 1010)*  
[0.3819660113, 0.3819660113, 0.3819660112, 0.3819660113, 0.3819660113, 0.3819660112,  
0.3819660113, 0.3819660113, 0.3819660112, 0.3819660113, 0.3819660113] (4)

> *ToSys(2, z, (1 - z[1]) \cdot (1 - z[2]), [2.5, 2.7])*

$[(1 - z_1)(1 - z_2), z_1]$  (5)

> *SFP2([(1 - x) \cdot (1 - y), x], x, y)*

$[[0.3819660113, 0.3819660113]]$  (6)

> #1i.

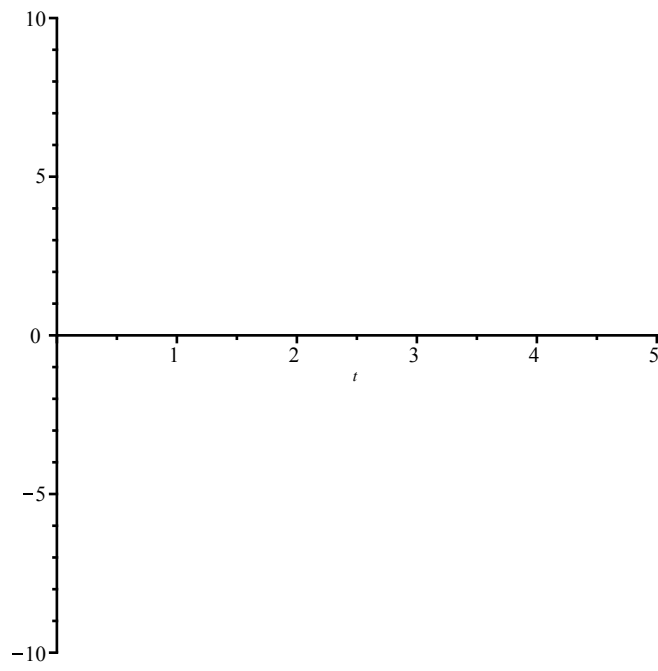
$evalf\left(dsolve\left(\left\{diff(x(t), t) = (5 - x(t)) \cdot (2 - x(t)) \cdot (5 - x(t)), x(0) = \frac{7}{2}\right\}, x(t)\right)\right)$   
 $x(t) = e^{RootOf(-1\pi e^{-Z} - \ln(e^{-Z} + 3)e^{-Z} + Ze^{-Z} - 9te^{-Z} + 2e^{-Z} + 3)} + 5.$  (7)

>  $evalf\left(dsolve\left(\left\{diff(x(t), t) = (5 - x(t)) \cdot (2 - x(t)) \cdot (5 - x(t)), x(0) = \frac{7}{2}\right\}, x(t)\right)\right)$

$x(t) = e^{RootOf(-1\pi e^{-Z} - \ln(e^{-Z} + 3)e^{-Z} + Ze^{-Z} - 9te^{-Z} + 2e^{-Z} + 3)} + 5.$  (8)

>  $plot\left(e^{RootOf(-1\pi e^{-Z} - \ln(e^{-Z} + 3)e^{-Z} + Ze^{-Z} - 9te^{-Z} + 2e^{-Z} + 3)} + 5, t=0..5\right)$

Warning, unable to evaluate the function to numeric values in the region; see the plotting command's help page to ensure the calling sequence is correct



```
>
```

```
> #1ii.
```

```
plot(Dis1((5 - y(t)) · (2 - y(t)) · (5 - y(t)), y, 7/2, 0.1, 5))
```

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> #maple is not allowing me to plot the functions
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# HW 15

4. AA      Aa      aa

|    |           |                     |           |
|----|-----------|---------------------|-----------|
| AA | AA: $u^2$ | AA: uv              | AA: 0     |
|    | Aa: 0     | Aa: uv              | Aa: 2uv   |
|    | aa: 0     | aa: 0               | aa: 0     |
| Aa | AA: uv    | AA: $\frac{v^2}{4}$ | AA: 0     |
|    | Aa: uv    | Aa: $\frac{v^2}{2}$ | Aa: vw    |
|    | aa: 0     | aa: $\frac{v^2}{4}$ | aa: vw    |
| aa | AA: 0     | AA: 0               | AA: 0     |
|    | Aa: 2uv   | Aa: vw              | Aa: 0     |
|    | aa: 0     | aa: vw              | aa: $w^2$ |

$$u_{n+1} = u_n^2 + uv_n + \frac{1}{4}v_n^2$$

$$v_{n+1} = uv_n + 2uv_n + vw_n + \frac{1}{2}v_n^2$$

$$w_{n+1} = \frac{1}{4}v_n^2 + vw_n + w_n^2$$

$$AA \times Aa$$

$$AA \times aa$$

$$Aa \times Aa$$

$$Aa \times aa$$

2. i)  $x(n) = x(n-1) + 2x(n-2) + 3x(n-3) + 11x(n-4)$      $x(0)=1, x(1)=5, x(2)=5, x(3)=2$

$$x(n-1) + x(n-3)$$

$$x_1(n) = F[x_1(n-1), x_1(n-2), x_1(n-3), x_1(n-4)]$$

$$x_2(n) = x_1(n-1) \Rightarrow x_2(n-1) = x_1(n-2)$$

$$x_3(n) = x_1(n-2) \Rightarrow x_3(n-1) = x_1(n-3)$$

$$x_4(n) = x_1(n-3) \Rightarrow x_4(n-1) = x_1(n-4)$$

$$x_1(n) = F[x_1(n-1), x_2(n-1), x_3(n-1), x_4(n-1)]$$

$$x_1(n) = \underline{x_1(n-1) + 2x_2(n-1) + 3x_3(n-1) + 11x_4(n-1)}$$

$$x_1(n-1) + x_3(n-1)$$