2) i) $X_1(n) = \dfrac{x_1(n) + 2x_2(n) + 3x_3(n) + 11x_4(n)}{x_1(n) + x_3(n)}$

ii) In map4

Father

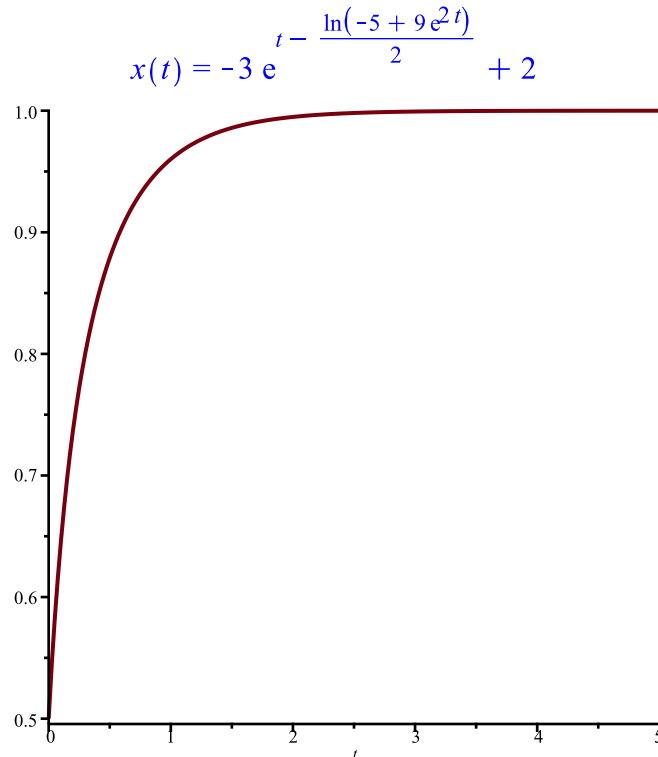|	AA	Aa	aa
	AA, aa	AAaa	AAaa
AA	u^2 0 0 $\frac{uv}{2}$ $\frac{uw}{2}$ 0 0 $\frac{uw}{2}$ 0		
Aa	$\frac{uv}{2}$ $\frac{uv}{2}$ 0 $\frac{v^2}{8}$ $\frac{v^2}{4}$ $\frac{v^2}{4}$ 0 $\frac{vw}{4}$ $\frac{3vw}{4}$		
aa	0 $\frac{uw}{2}$ 0 0 $\frac{vw}{4}$ $\frac{vw}{4}$ 0 0 w^2		

4) mother   AA   u

   Aa   v

   aa   w

AA: $u^2 + uv + \frac{1}{4}v^2$

Aa: $uv + 2uw + \frac{1}{2}v^2 + uw$ ✓

aa: $\frac{v^2}{4} + uw + w^2$

```
> #Hrudai Battini HW15  RUID: 185007576
  read "/Users/hb334/Documents/M15.txt";
  #2
  dsolve({diff(x(t),t) = (1-x(t))*(2-x(t))*(3-x(t)), x(0)=0.5},x(t)
  ); #I am unable to return a function using dsolve by #using my
  RUID.
  plot( -3*exp(t - ln(-5 + 9*exp(2*t))/2) + 2, t=0..5);
  print(Dis1);
  L := Dis1(-3*exp(t - ln(-5 + 9*exp(2*t))/2) + 2, t,0.5,0.1,1):
  plot(L);
  L2:= Dis1(-3*exp(t - ln(-5 + 9*exp(2*t))/2) + 2, t,0.5,0.01,1):
  plot(L2);
```
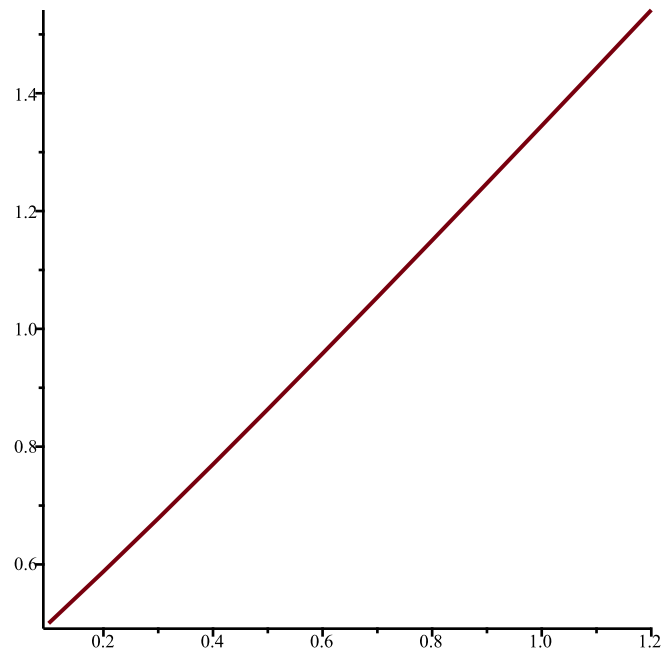
$$x(t) = -3\,e^{\,t\,-\,\dfrac{\ln\left(-5\,+\,9\,e^{2\,t}\right)}{2}} + 2$$

$$\mathbf{proc}(F, y, y0, h, A)$$
$$\quad \mathbf{local}\ L, x, i;$$
$$\quad L := Orb(x + h * subs(y = x, F), x, y0, 0, \mathrm{trunc}(A/h));$$
$$\quad L := [\,seq(\,[i * h, L[i]], i = 1..nops(L)\,)\,]$$
$$\mathbf{end\ proc}$$

```
> #2? Repeated 2
  X := ToSys(4,x,(x[1]+2*x[2]+3*x[3]+11*x[4])/(x[1]+x[3]),[1,5,5,2]
  );
  #k=4, f=x[1]+2*x[2]+3*x[3]+11*x[4])/(x[1]+x[3] and INI = [1,5,5,
  2].
```

$$X := \left[\frac{x_1 + 2\,x_2 + 3\,x_3 + 11\,x_4}{x_1 + x_3}, x_1, x_2, x_3 \right], [1, 5, 5, 2] \tag{1}$$

```
> #3
  #print(Orbk);
  Orbk(2,z,(1-z[1])*(1-z[2]),[2.5,2.7],1000,1005);
  #print(ToSys);
  F:=ToSys(2,z,(1-z[1])*(1-z[2]),[2.5,2.7]);
  #print(SFP2[1]);
  SFP2(F[1],z[1],z[2]);
```

$$[0.3819660113, 0.3819660113, 0.3819660112, 0.3819660113, 0.3819660113, 0.3819660112]$$

$$F := \left[\left(1 - z_1 \right) \left(1 - z_2 \right), z_1 \right], [2.5, 2.7]$$

$$[[0.3819660113, 0.3819660113]] \tag{2}$$

```
> #4
  print(HW3);
  print(HW2);
```

$\textbf{proc}(u, v, w)$

$\quad [u\verb|^|2 + v*u + 1/4*v\verb|^|2, v*u + 2*u*w + 1/2*v\verb|^|2 + v*w, 1/4*v\verb|^|2 + v*w + w\verb|^|2]$

$\textbf{end proc}$

$\textbf{proc}(u, v)$ (3)

$\quad expand([u\verb|^|2 + v*u + 1/4*v\verb|^|2, v*u + 2*u*(1-u-v) + 1/2*v\verb|^|2 + v$

$\quad *(1-u-v)])$

$\textbf{end proc}$