

```

function dxdt=harvest(t,x)
dxdt=zeros(1,1);
r=1;
k=10;
h=9/10;
dxdt(1)=r*x(1)*(1-x(1)/k)-h;
end

```

%Population Growth with Harvesting

%Analytical Solution

syms r x(t) h k

f=diff(x,t,1)==r*x*(1-x/k)-h

f2=x(0)==2

dsolve(f,f2)

%Numerical Solution

[t x]=ode45(@harvest,[0 10],2);

plot(t,x);xlabel('Time');ylabel('Population');title('Population Growth with Harvesting')

$$f(t) = \text{diff}(x(t), t) == -h - r*x(t)*(x(t)/k - 1)$$

$$f_2 = x(0) == 2$$

$$\begin{aligned} \text{ans} = & \frac{(2*\tan((\text{atan}((2*r - (k*r)/2)/(h*k*r - (k^2*r^2)/4)^{1/2}))/(\text{h}*k*\text{r} - (k^2*\text{r}^2)/4)^{1/2}) - t/\text{k})*(\text{h}*k*\text{r} - (k^2*\text{r}^2)/4)^{1/2})*(\text{h}*k*\text{r} - (k^2*\text{r}^2)/4)^{1/2} + \text{k}*\text{r})/(2*\text{r})}{\text{h}} \end{aligned}$$