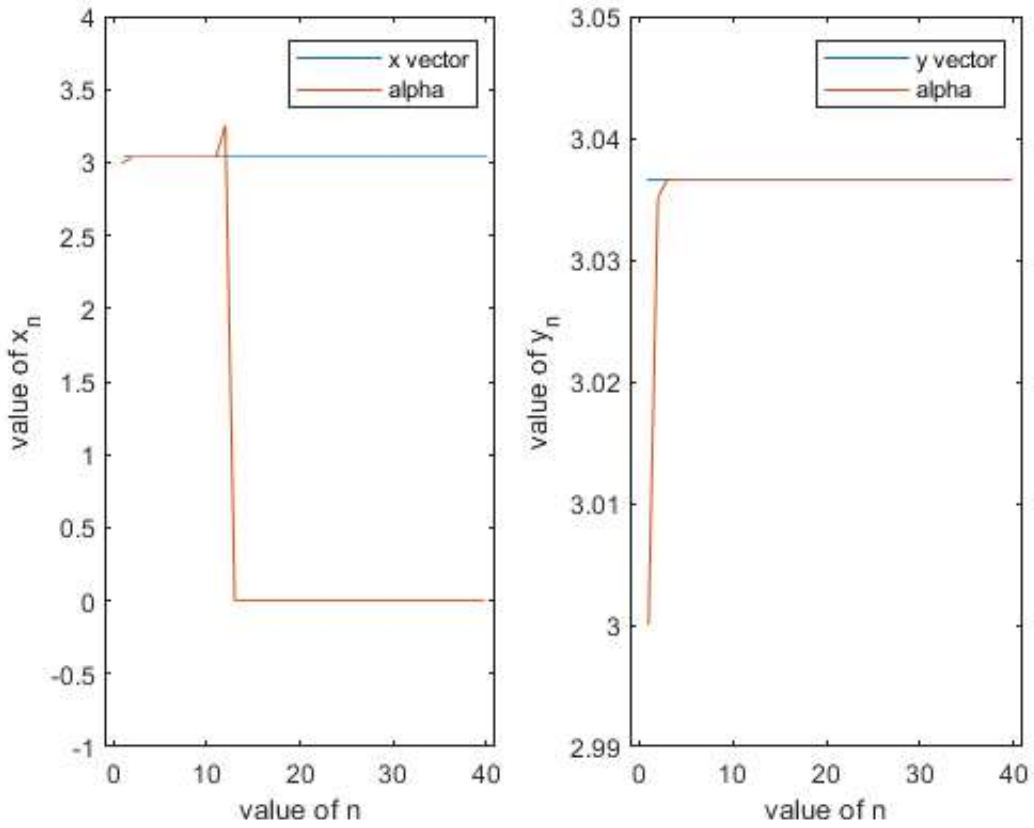
```
%1.i
x = zeros(1,40);
xn = 3;
n=1;
while n~= 41
    x(1,n) = xn;
    xn = 5^n *sqrt(4*(2- sqrt(4-(xn/5^n)^2)));
    n = n+1;
end
fprintf("1.i) the vector x is \n")
fprintf('%1.4f ',x)

%1.ii
naxis = (1:40);
constant = ones(1,40)*3.0366;
subplot(1,2,1)
plot(naxis,constant,naxis,x),axis([-1,41,-1,4]), legend('x vector','alpha'),xlabel('value of
n'),ylabel('value of x_n')

%1.v
y = zeros(1,40);
yn = 3;
n = 1;
 while n ~= 41
     y(1,n) = yn;
     yn = (4*yn)/(sqrt(4*(2+ sqrt(4-(yn/5^n)^2))));
     n = n+1;
 end
fprintf("\n\n1.v) the vector y is \n")
fprintf('%1.4f ',y)

%1.vi
naxis = (1:40);
constant = ones(1,40)*3.0366;
subplot(1,2,2)
plot(naxis,constant,naxis,y),axis([-1,41,2.99,3.05]), legend('y vector','alpha'),xlabel('valu
e of n'),ylabel('value of y_n')

%2.a
xn = 2;
n = 0;
test = true;
x = zeros(1);
while test == true
    xn2 = (16*xn^5 + 1)/(20*xn^4 - 1);
    if ((xn - xn2)^2) < 10^(-20)
        if ((4*xn2^5 - xn2 -1)^2) < 10^(-20)
            test = false;
        end
    end
    xn = xn2;
    n = n+1;
    x(1,n)=xn;
    if n == 1000
        test = false;
```

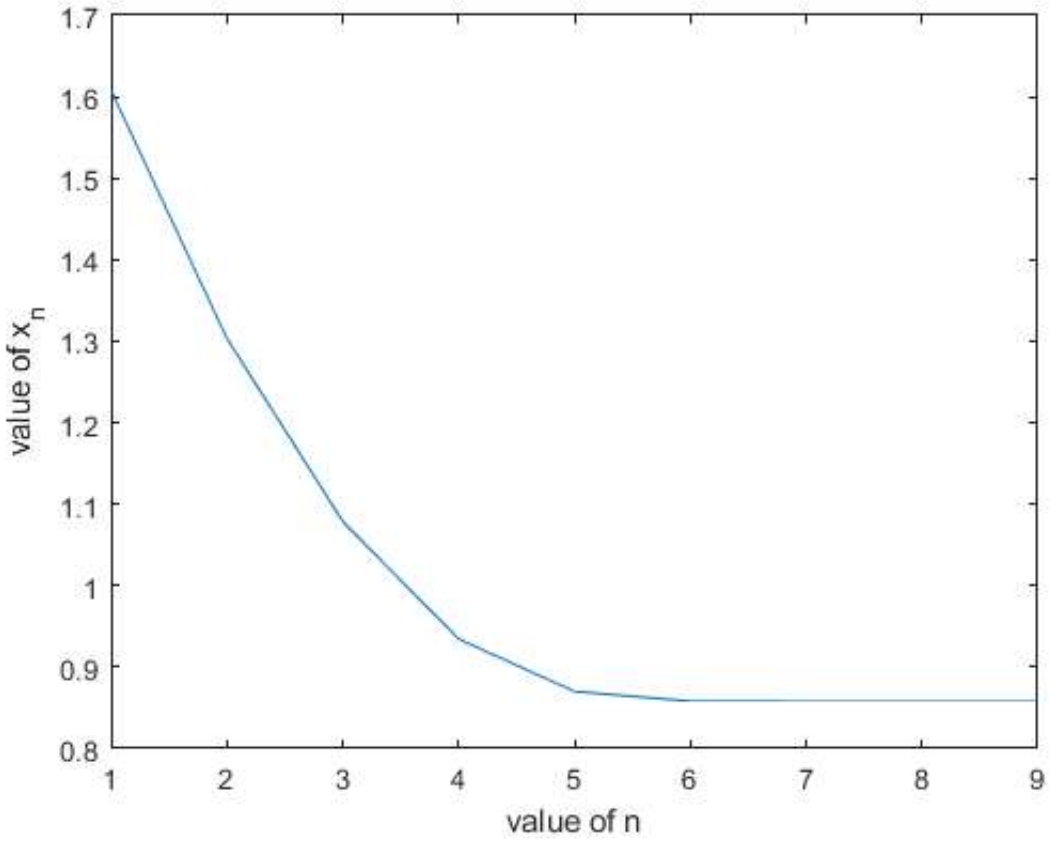
```
    end
end
fprintf("\n\n2.a)the final value of x is ")
fprintf('%f \n',x(1,n))
figure(2)
naxis = (1:n);
plot(naxis,x),xlabel('value of n'),ylabel('value of x_n')
```

```
1.i) the vector x is
3.0000 3.0352 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0369 3.0385 3.2539 0.0000 0.
0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00
00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
```

```
1.v) the vector y is
3.0000 3.0352 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.
0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.03
66 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366 3.0366
```

```
2.a)the final value of x is 0.857804
```



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