

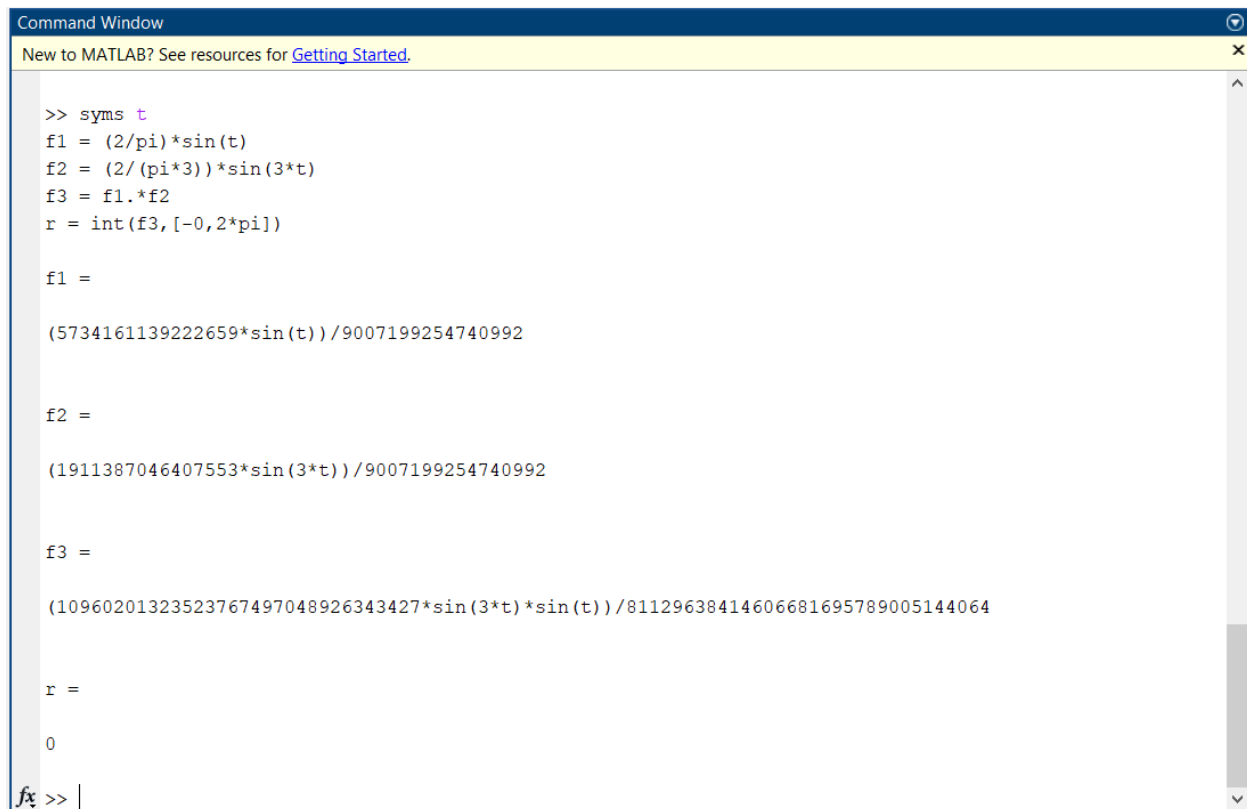
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s.c:98411432

Q1)

F1 and f2 are orthogonal and All terms of Fourier series are orthogonal.

```
syms t
f1 = (2/pi)*sin(t)
f2 = (2/(pi*3))*sin(3*t)
f3 = f1.*f2
r = int(f3, [-0, 2*pi])
```

A screenshot of the MATLAB Command Window. The window has a title bar "Command Window" and a yellow banner at the top that says "New to MATLAB? See resources for [Getting Started.](#)". The command history shows the following code being executed: 

```
>> syms t
f1 = (2/pi)*sin(t)
f2 = (2/(pi*3))*sin(3*t)
f3 = f1.*f2
r = int(f3, [-0, 2*pi])
```

 The output shows the symbolic expressions for f1, f2, f3, and the result r. 

```
f1 =
(5734161139222659*sin(t))/9007199254740992

f2 =
(1911387046407553*sin(3*t))/9007199254740992

f3 =
(10960201323523767497048926343427*sin(3*t)*sin(t))/81129638414606681695789005144064

r =
0
```

 The prompt "fx >> |" is visible at the bottom left.

Q2)

clc

clear

close all

Ts = 1/100;

T = 2;

```

t = 0:Ts:T-Ts;

n1 = 10;

figure(1)

plot(t, sawtooth(5*pi*t))

a = zeros(1,n1+1);

b = zeros(1,n1+1);

for n = 0:n1

a(n+1) = (2*Ts/T)*sum(sawtooth(5*pi*1*t/T).*cos(2*pi*n*t/T));

b(n+1) = (2*Ts/T)*sum(sawtooth(5*pi*1*t/T).*sin(2*pi*n*t/T));

end

t2 = -2*T:Ts:2*T;

fs = (a(1)/2)*ones(size(t2));

for n = 1:n1

fs = fs + (a(n+1)*cos(2*pi*n*t2/T)+b(n+1)*sin(2*pi*n*t2/T));

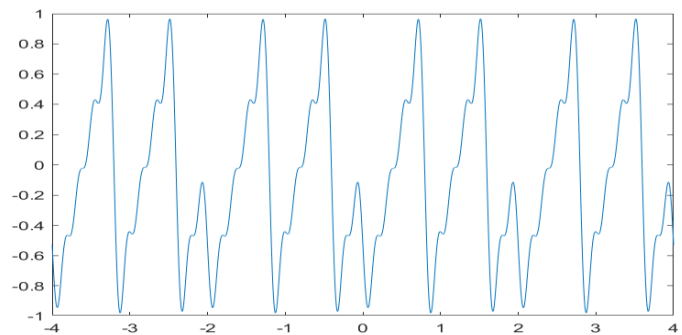
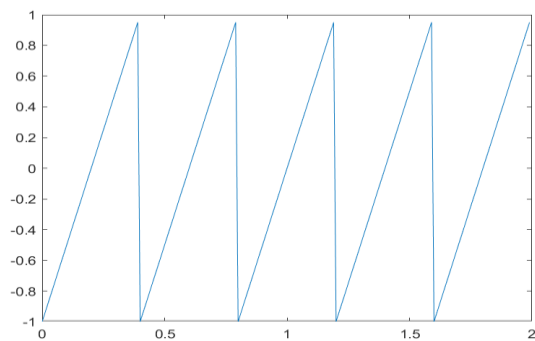
end

figure(2)

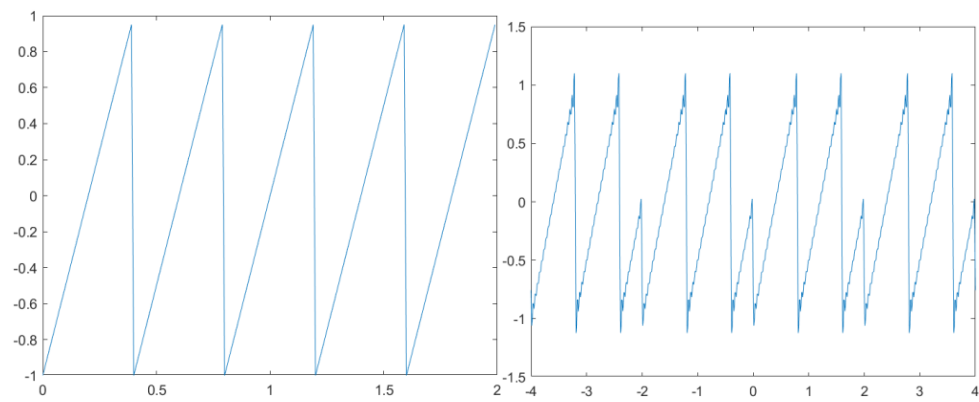
plot(t2,fs)

```

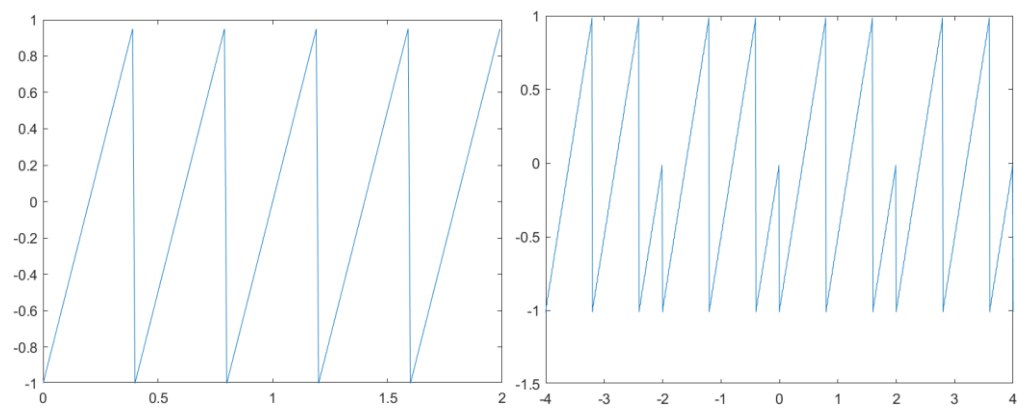
n1=10



**n1=50**



**n1=100**



**n1=10000**

