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% Fall 2018
% Name: Terry-Ann Sneed
% Lab #6

clc clear
all close
all

syms t k L n
% Initialize symbolic variables

evalin(symengine, 'assume(k,Type::Integer)'); % Let matlab know that
the variable k is an integer

a = @(f,t,k,L) int(f*cos(k*pi*t)/L,t,-L,L); %create kth cosine
coefficient a

b = @(f,t,k,L) int(f*sin(k*pi*t)/L,t,-L,L); % create kth sine
coefficient b

fs = @(f,t,n,L) a(f,t,0,L)/2 + ...
symsum(a(f,t,k,L)*cos(k*pi*t/L) + b(f,t,k,L)*sin(k*pi*t/L),k,1,n); %
generate the nth partial sum

f = t; % Original function

subplot(6,1,1), ezplot(fs(f,t,2,1),-1,1) % Plotting the functions
and the partial sum

hold on ezplot(f,-1,1) subplot(6,1,2), ezplot(fs(f,t,10,1),-1,1) %
Plotting the functions and the partial sum

hold on ezplot(f,-1,1) hold off title('Partial sum with
n=10'),xlabel('Time'),ylabel('Amplitude')

subplot(6,1,3), ezplot(fs(f,t,20,1),-1,1) % Plotting the
functions and the partial sum

hold on ezplot(f,-1,1) hold off title('Partial sum with
n=20'),xlabel('Time'),ylabel('Amplitude')

subplot(6,1,4), ezplot(fs(f,t,50,1),-1,1) % Plotting the
functions and the partial sum

hold on ezplot(f,-1,1) hold off title('Partial sum with
n=50'),xlabel('Time'),ylabel('Amplitude')

subplot(6,1,5), ezplot(fs(f,t,100,1),-1,1) % Plotting the
functions and the partial sum hold on
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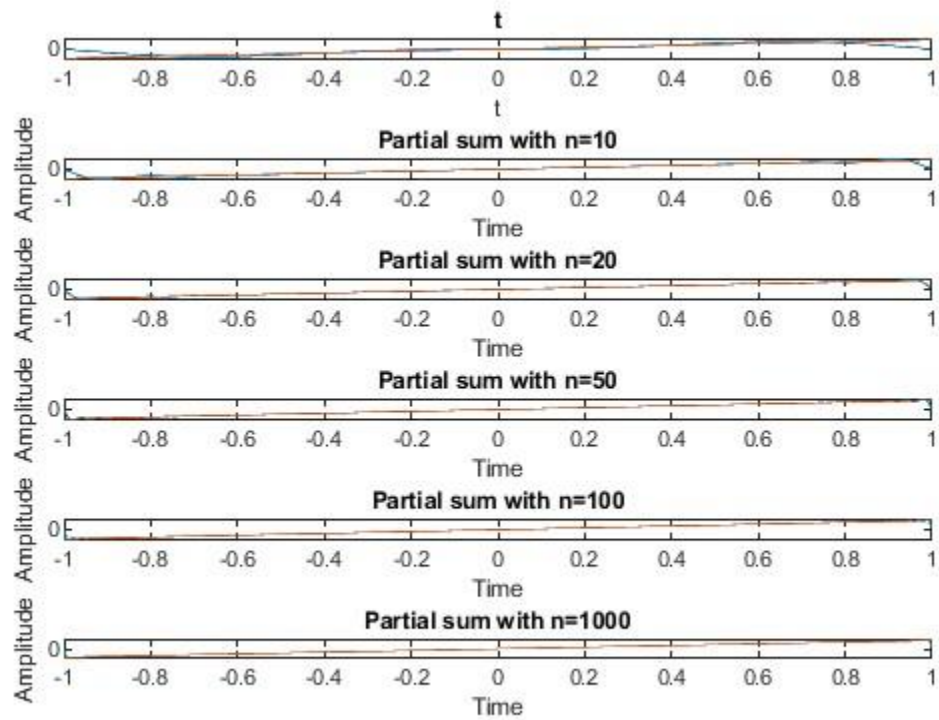
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ezplot(f,-1,1) hold off title('Partial sum with
n=100'),xlabel('Time'),ylabel('Amplitude')
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subplot(6,1,6), ezplot(fs(f,t,1000,1),-1,1)      % Plotting the
functions and the partial sum hold on ezplot(f,-1,1) hold off
title('Partial sum with n=1000'),xlabel('Time'),ylabel('Amplitude')

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