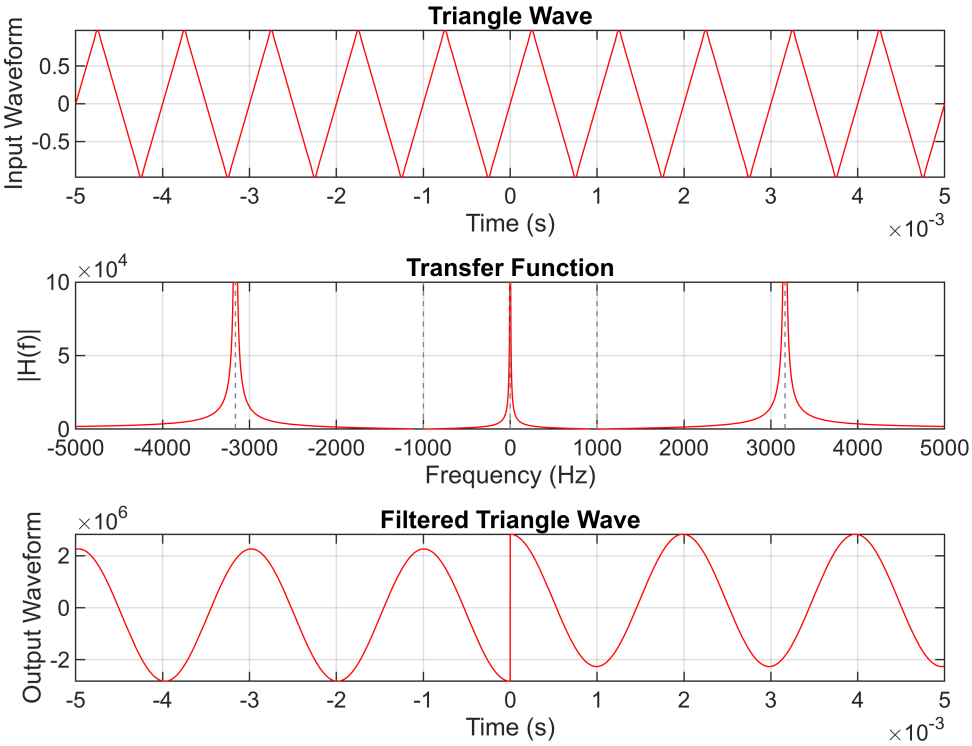
Pre-Work and Lab Work

```
syms t f;
harmonics = 15;
triangleWave = 0;
C1 = 28.145e-9;
C2 = 253.3e-9;
L = 100e-3;

for k = 1:2:harmonics
    coefficient = (-1)^((k-1)/2) * (8 / (pi^2 * k^2));
    triangleWave = triangleWave + coefficient * sin(2 * pi * k * 1e3 * t);
end

freqC1 = 1 / (j * 2 * pi * f * C1);
freqC2 = 1 / (j * 2 * pi * f * C2);
freqL = j * 2 * pi * f * L;

transferFunction = vpa(((freqL + freqC2)^-1 + freqC1^-1)^-1);

outputWave = subs(ifourier(transferFunction), f, triangleWave);

subplot(3, 1, 1);
fplot(triangleWave, [-5e-3 5e-3], 'Color', [1, 0, 0]);
xlabel('Time (s)');
ylabel('Input Waveform');
title('Triangle Wave');
grid on;

subplot(3, 1, 2);
fplot(abs(transferFunction), [-5e3 5e3], 'Color', [1, 0, 0]);
xlabel('Frequency (Hz)');
ylabel('|H(f)|');
title('Transfer Function');
grid on;
ylim([0 10e4])
xticks(-5000:1000:5000);
xticklabels({'-5000', '-4000', '-3000', '-2000', '-1000', '0', '1000', '2000',
'3000', '4000', '5000'});

subplot(3, 1, 3);
fplot(outputWave, [-5e-3 5e-3], 'Color', [1, 0, 0]);
xlabel('Time (s)');
ylabel('Output Waveform');
title('Filtered Triangle Wave');
grid on;
```


Triangle Wave
Input Waveform
0.5
0
-0.5
-5
-4
-3
-2
-1
0
1
2
3
4
5
Time (s)
×10-3
Transfer Function
×10^4
10
5
0
|H(f)|
-5000
-4000
-3000
-2000
-1000
0
1000
2000
3000
4000
5000
Frequency (Hz)
Filtered Triangle Wave
×10^6
2
0
-2
Output Waveform
-5
-4
-3
-2
-1
0
1
2
3
4
5
Time (s)
×10-3