```matlab
clc; clear; close all;
set(0,'defaultTextInterpreter','latex');
```

# Question 3: The conv Command

```matlab
% Setting up functions
n = 0:20;
f = @(n) (n >= 0) - (n >= 4);
g = @(n) n.*(n >= 0) - 2*(n-4).*(n >= 4) + (n-8).*(n >= 8);


% f*f conv
conv_ff = conv(f(n), f(n));
length_conv_ff = 0:length(conv_ff) - 1;
figure; stem(length_conv_ff, conv_ff);
title('f(n) * f(n)');
xlabel('n');
ylabel('f(n) * f(n)');
grid on;

% f*f*f conv
conv_fff = conv(conv_ff, f(n));
length_conv_fff = 0:length(conv_fff) - 1;
figure; stem(length_conv_fff, conv_fff);
title('f(n) * f(n) * f(n)');
xlabel('n');
ylabel('f(n) * f(n) * f(n)');
grid on;

% f*g conv
conv_fg = conv(f(n), g(n));
length_conv_fg = 0:length(conv_fg) - 1;
figure; stem(length_conv_fg, conv_fg);
title('f(n) * g(n)');
xlabel('n');
ylabel('f(n) * g(n)');
grid on;

% f*impulse conv
impulse = [1]
conv_fi = conv(g(n), impulse);
length_conv_fi = 0:length(conv_fi) - 1;
figure; stem(length_conv_fi, conv_fi);
title('g(n)*impulse(n)');
xlabel('n');
ylabel('g(n)*impulse(n)');
grid on;

% g*g conv
conv_gg = conv(g(n), g(n));
length_conv_gg = 0:length(conv_gg) - 1;
```
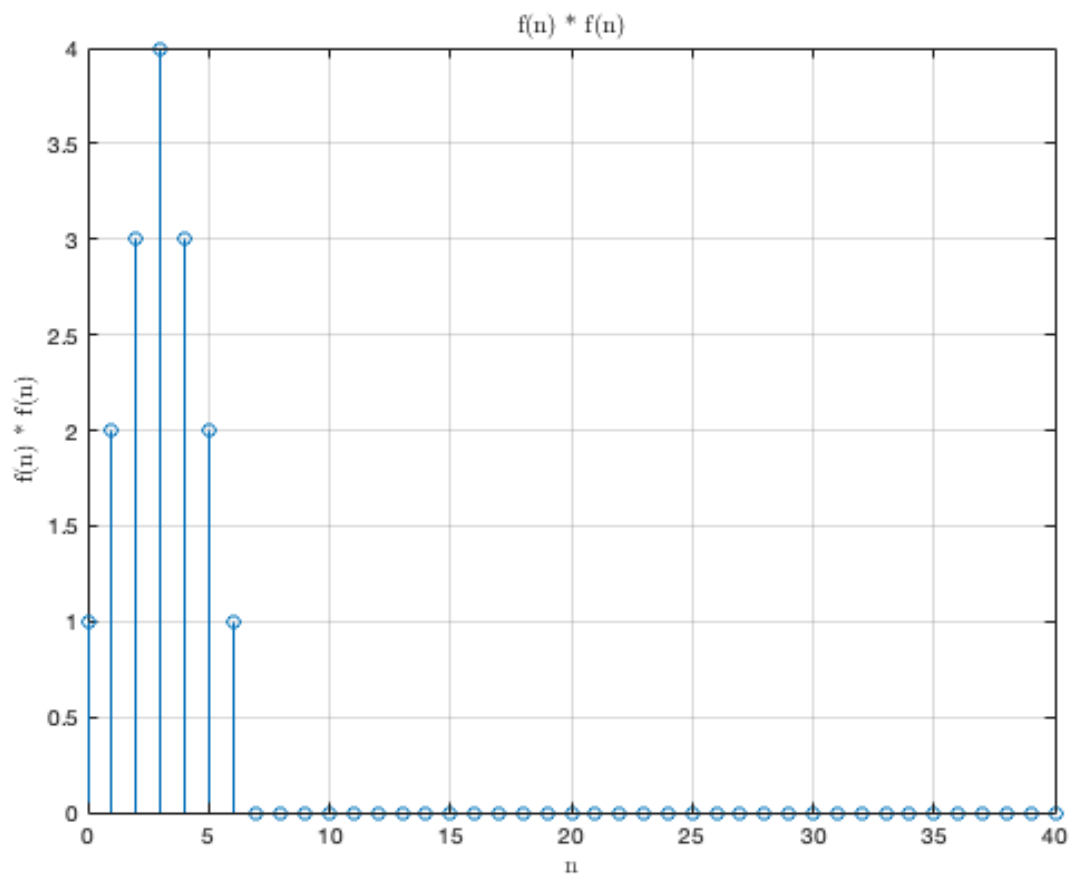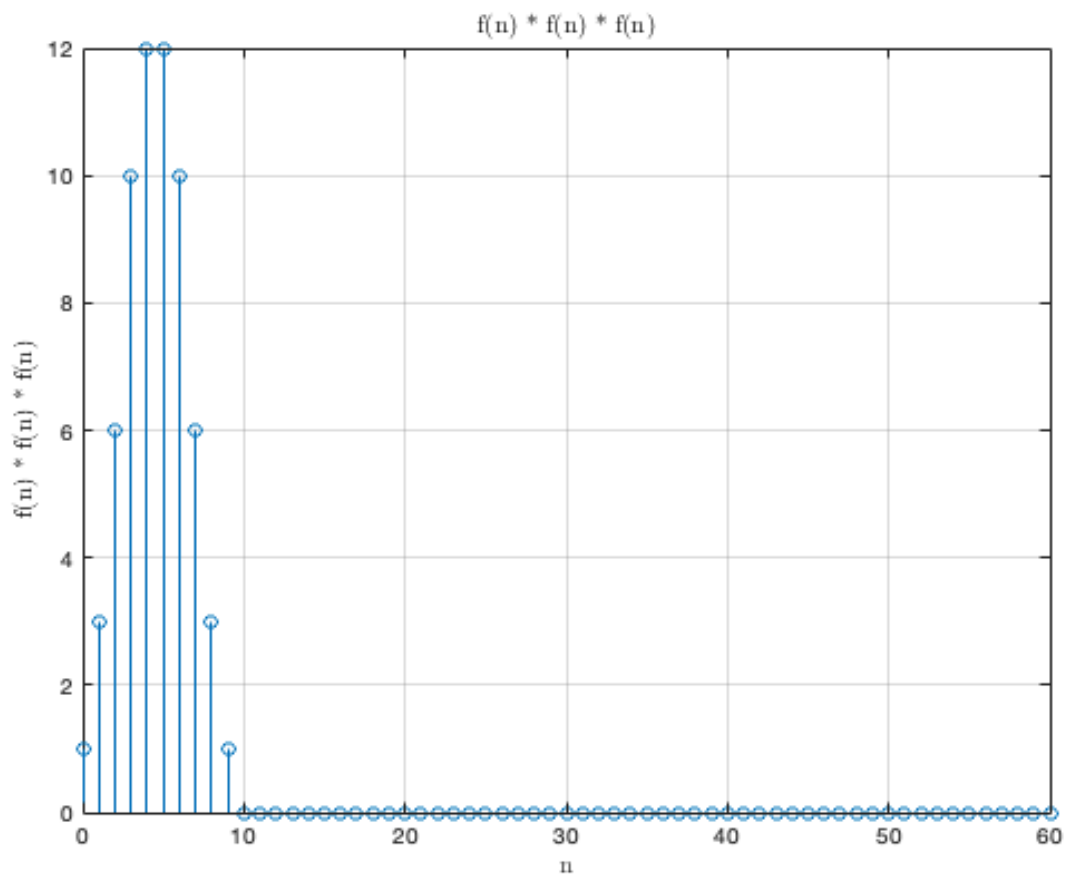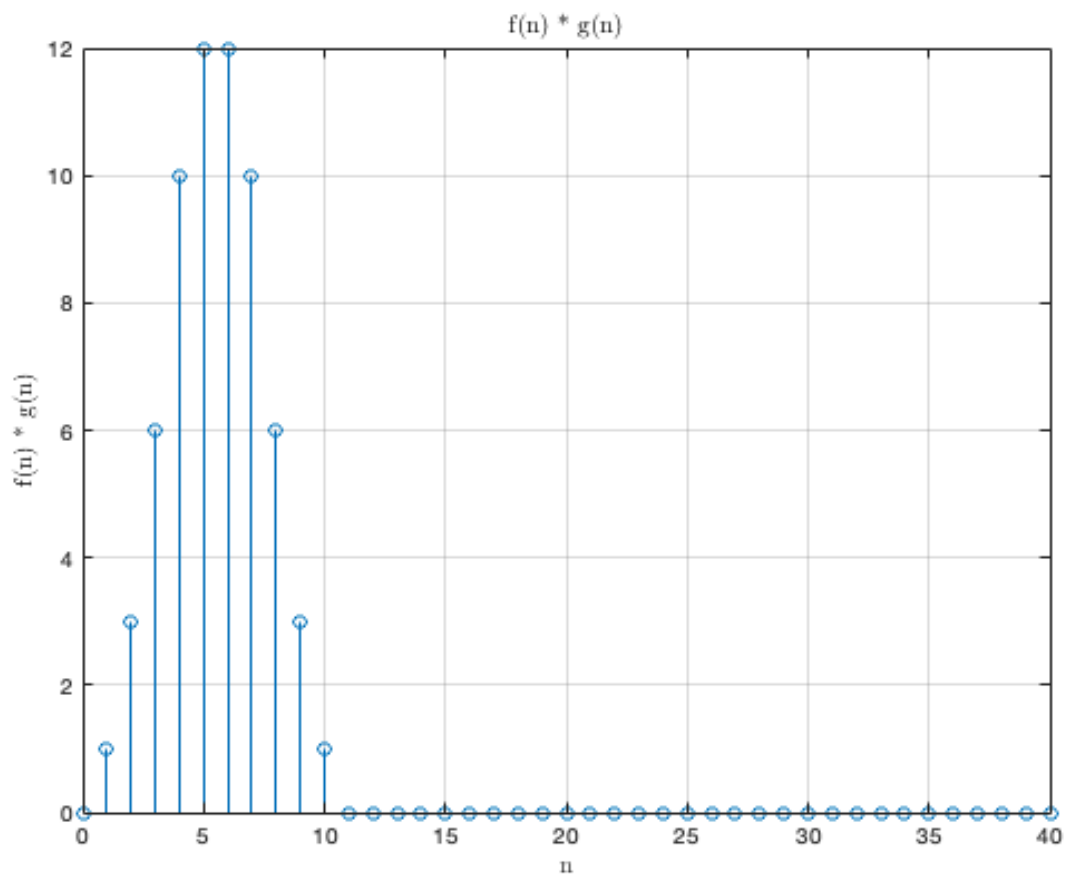
```
figure; stem(length_conv_gg, conv_gg);
title('g(n)*g(n)');
xlabel('n');
ylabel('g(n)*g(n)');
grid on;
```
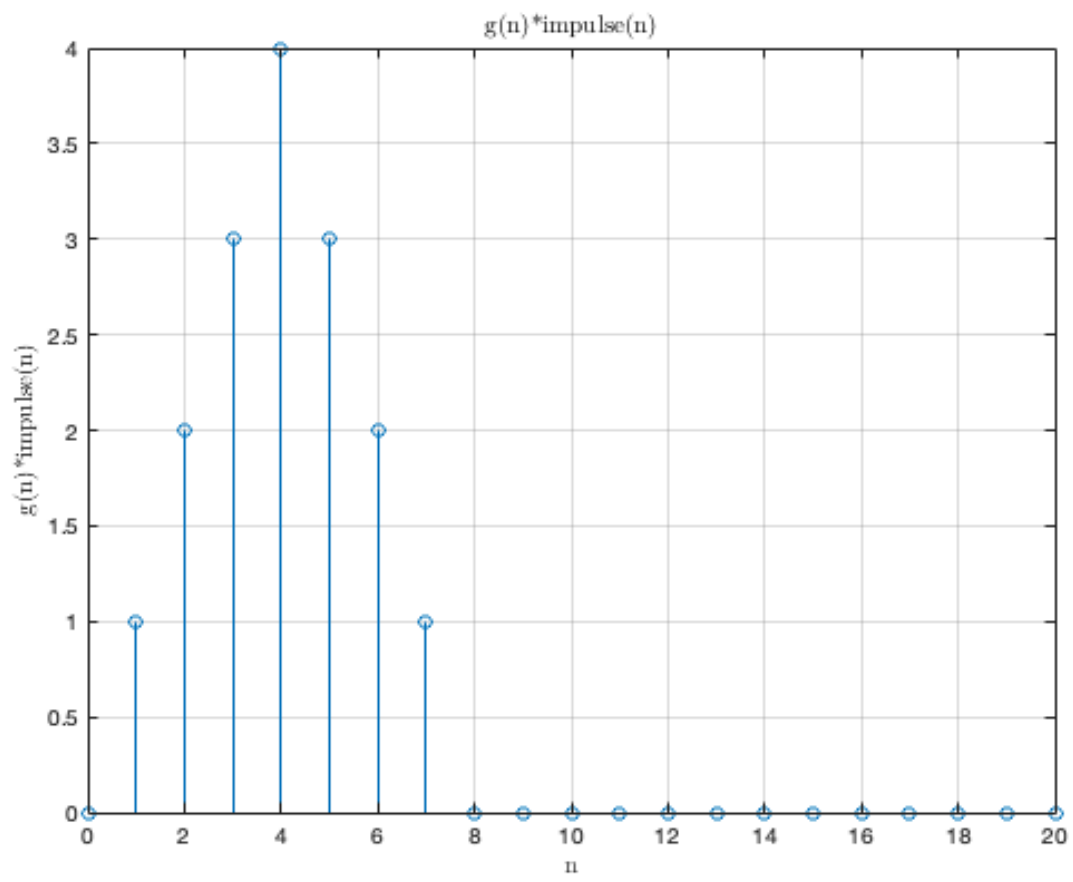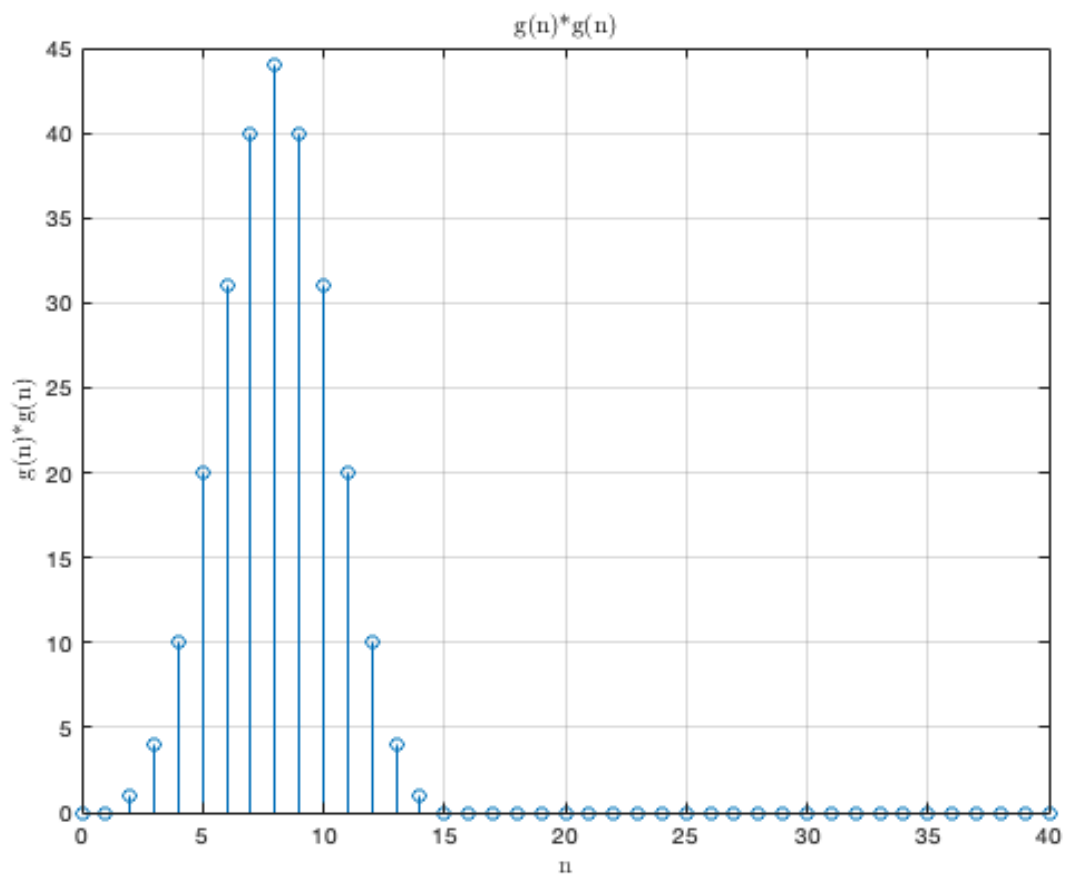
*impulse =*

    *1*

f( n ) * f( n ) * f( n )

f(n) * g(n)

g(n)*impulse(n)

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