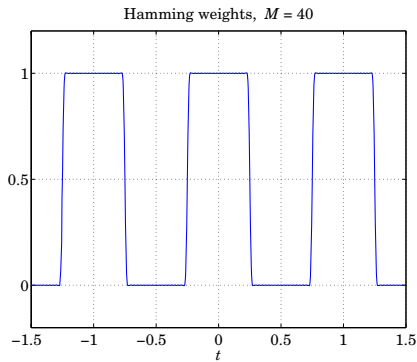
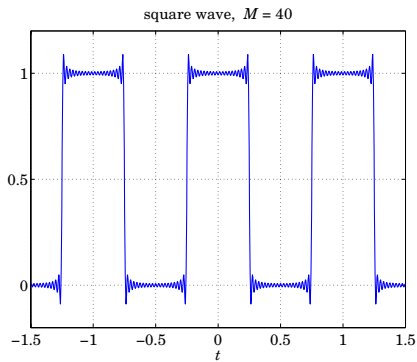
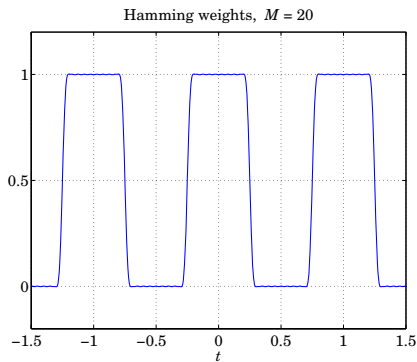
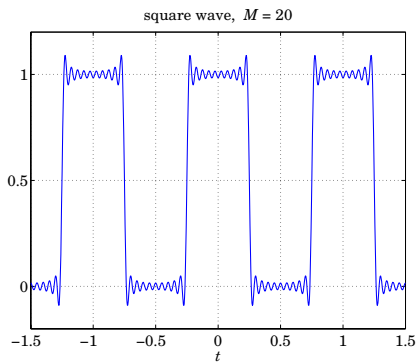
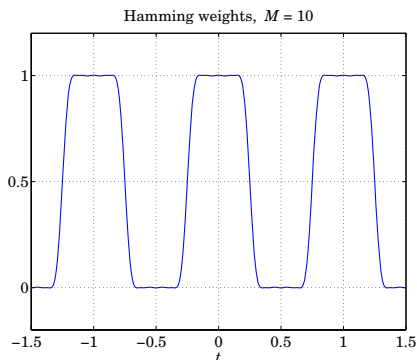
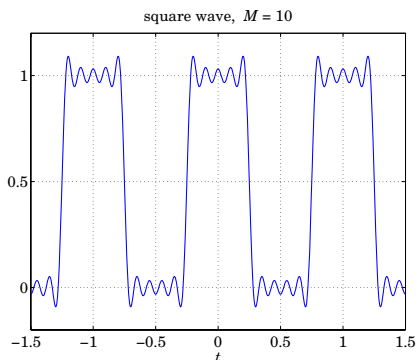


332:345 - Linear Systems - Fall 2009
Gibbs Phenomenon and Windowing

```
T=1; tau=1/2; t = linspace(-1.5,1.5,3001);
M = 10; f = 0; fw = 0;
for m=-M:M,
    cm = tau/T * sinc(m*tau/T);
    f = f + cm * exp(j*2*pi*t*m/T);
    wm = 0.54 + 0.46*cos(pi*m/M);           % Hamming window weights
    fw = fw + wm * cm * exp(j*2*pi*t*m/T);
end
f = real(f); fw = real(fw);
figure; plot(t,f); ylim([-0.2,1.2]); set(gca,'ytick',0:0.5:1); grid;
figure; plot(t,fw); ylim([-0.2,1.2]); set(gca,'ytick',0:0.5:1); grid;
```



```

T=1; t = linspace(-1,2,3001);
M = 10; f = 0; fw = 0;
for m=-M:M,
    if m==0, cm=1/2; else cm=j/(2*pi*m); end
    f = f + cm * exp(j*2*pi*t*m/T);
    wm = 0.54 + 0.46*cos(pi*m/M); % Hamming window weights
    fw = fw + wm * cm * exp(j*2*pi*t*m/T);
end
f = real(f); fw = real(fw);
figure; plot(t,f); ylim([-0.2,1.2]); set(gca,'ytick',0:0.5:1); grid;
figure; plot(t,fw); ylim([-0.2,1.2]); set(gca,'ytick',0:0.5:1); grid;

```

