for all parts: magenta= frequency response of interpolating lowpass filter
black=original Fourier Transform of signal
red= lower half of replica centered at sampling rate
blue=upper half of replica centered at negative of sampling rate
green=sum of red+black+blue over -ws/2 <w < -ws/2 (demarcated by dashed vertical lines)

3(a) meets all three criteria for perfect reconstruction
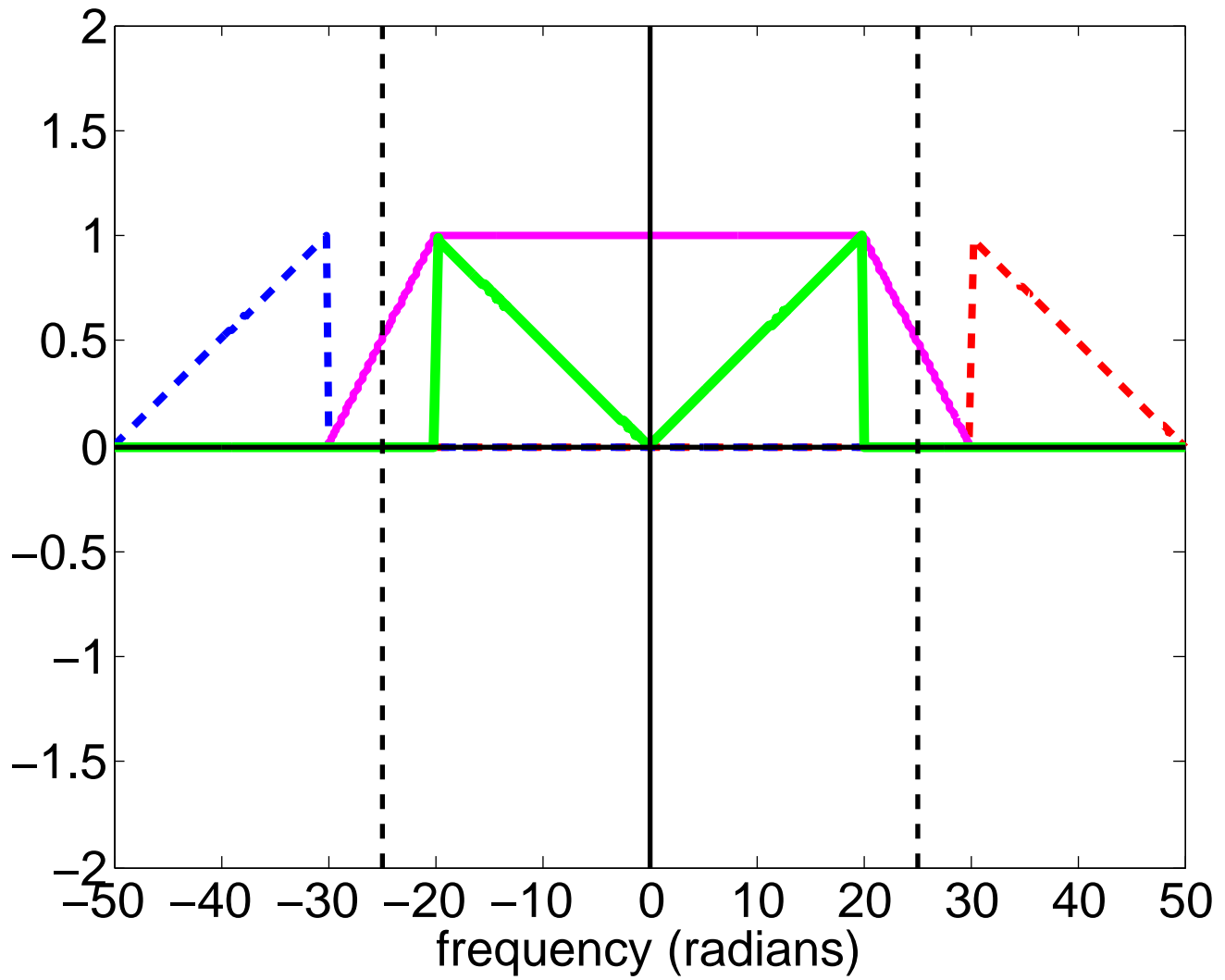
frequency (radians)
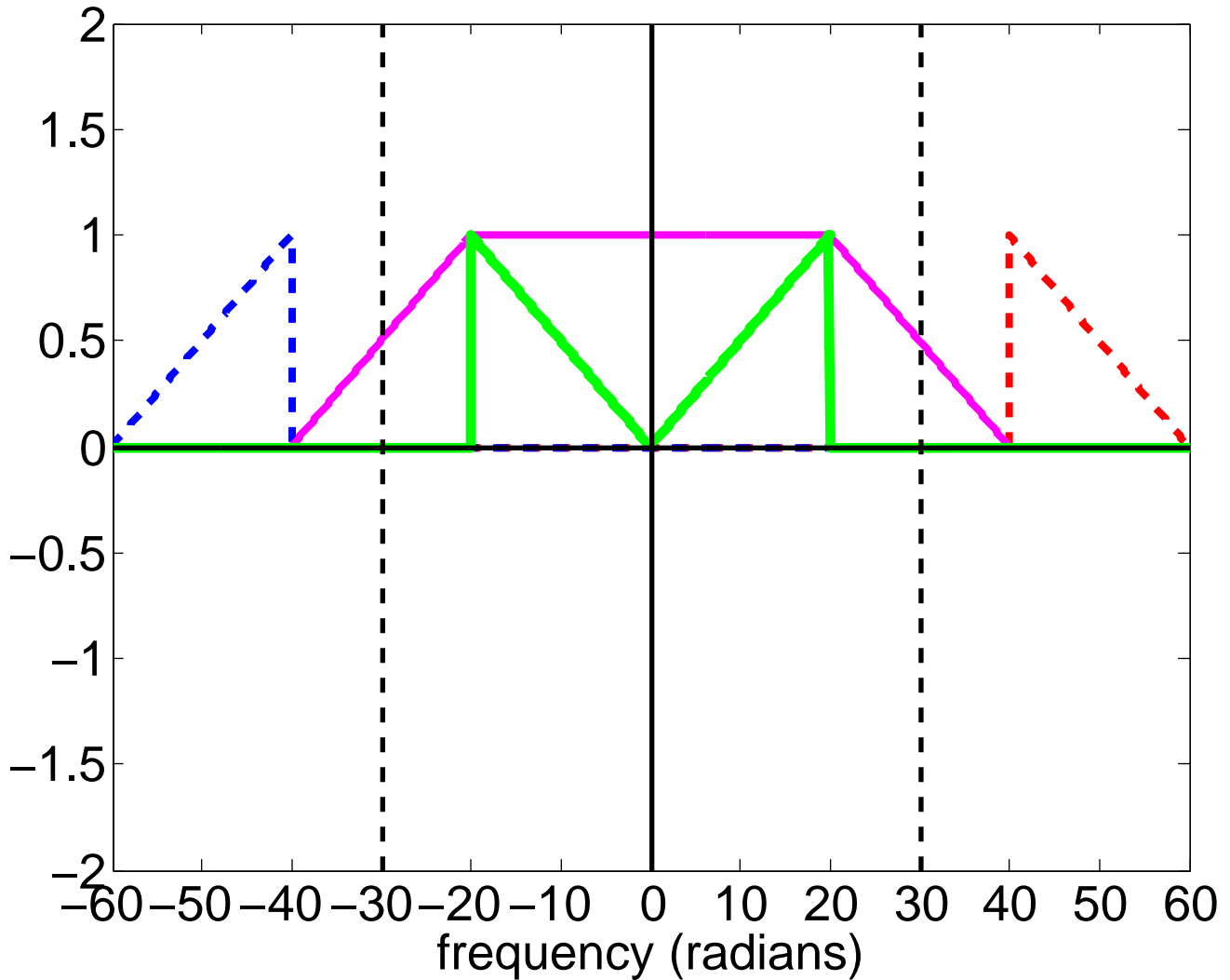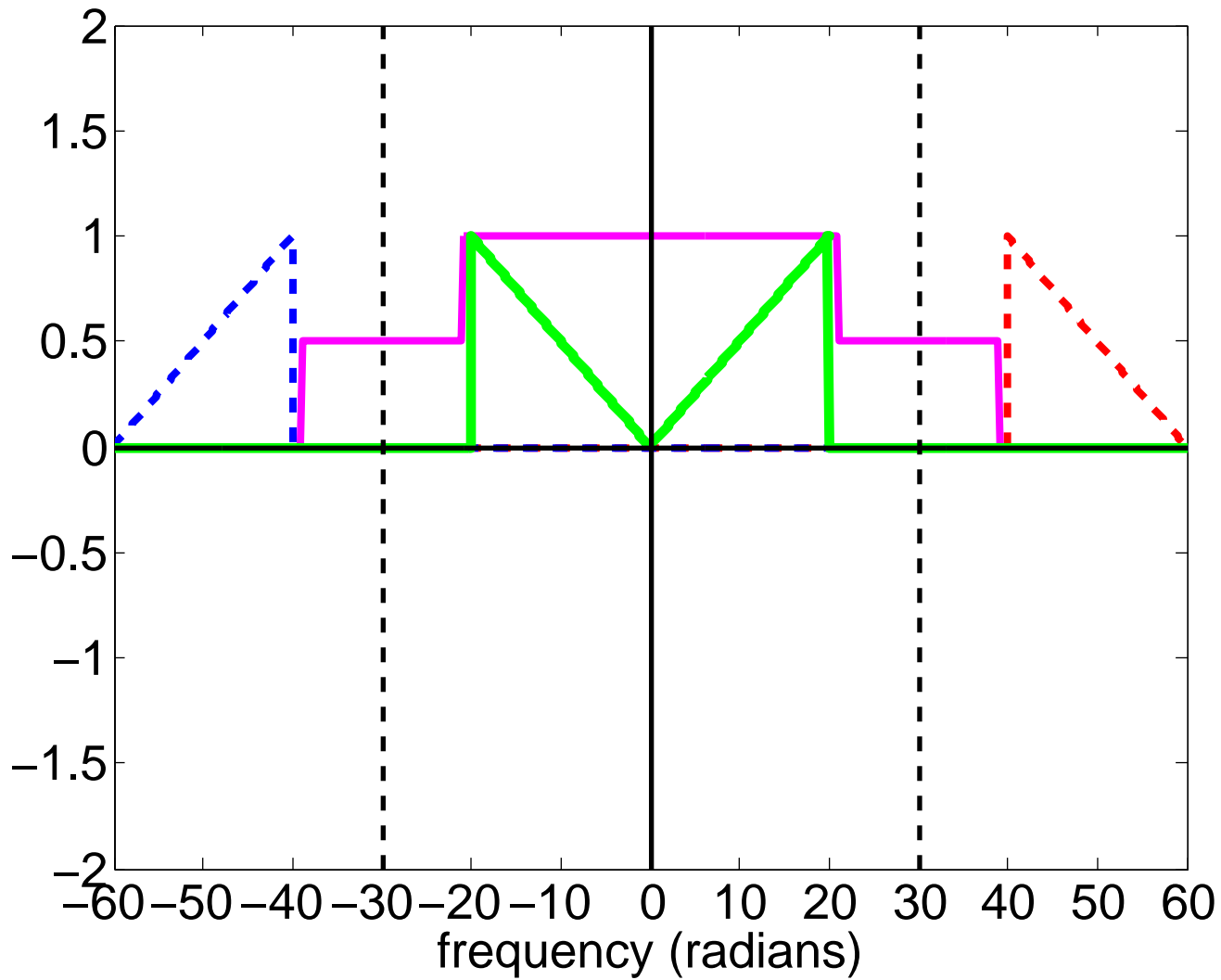
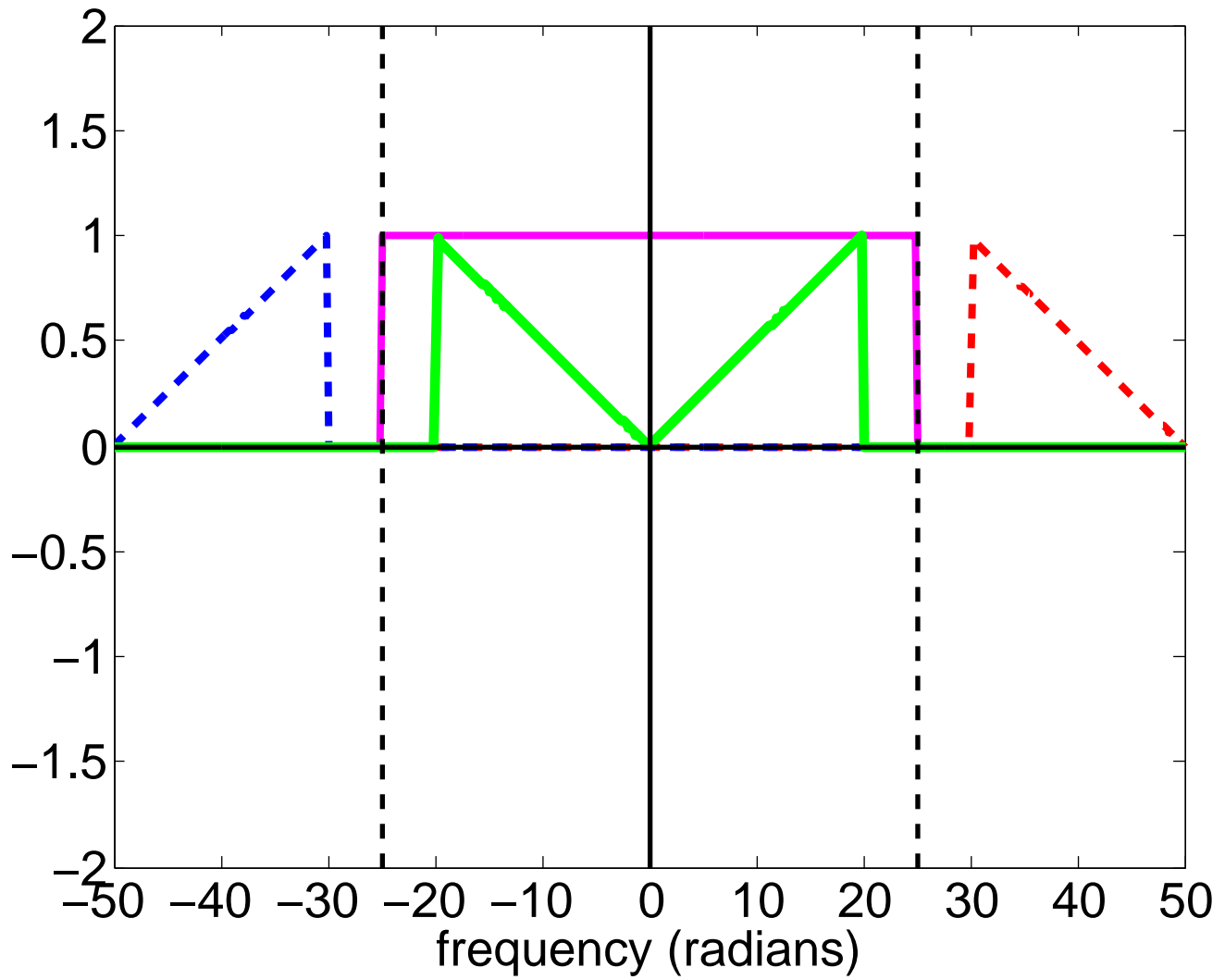3(b) meets all three criteria for perfect reconstruction

frequency (radians)
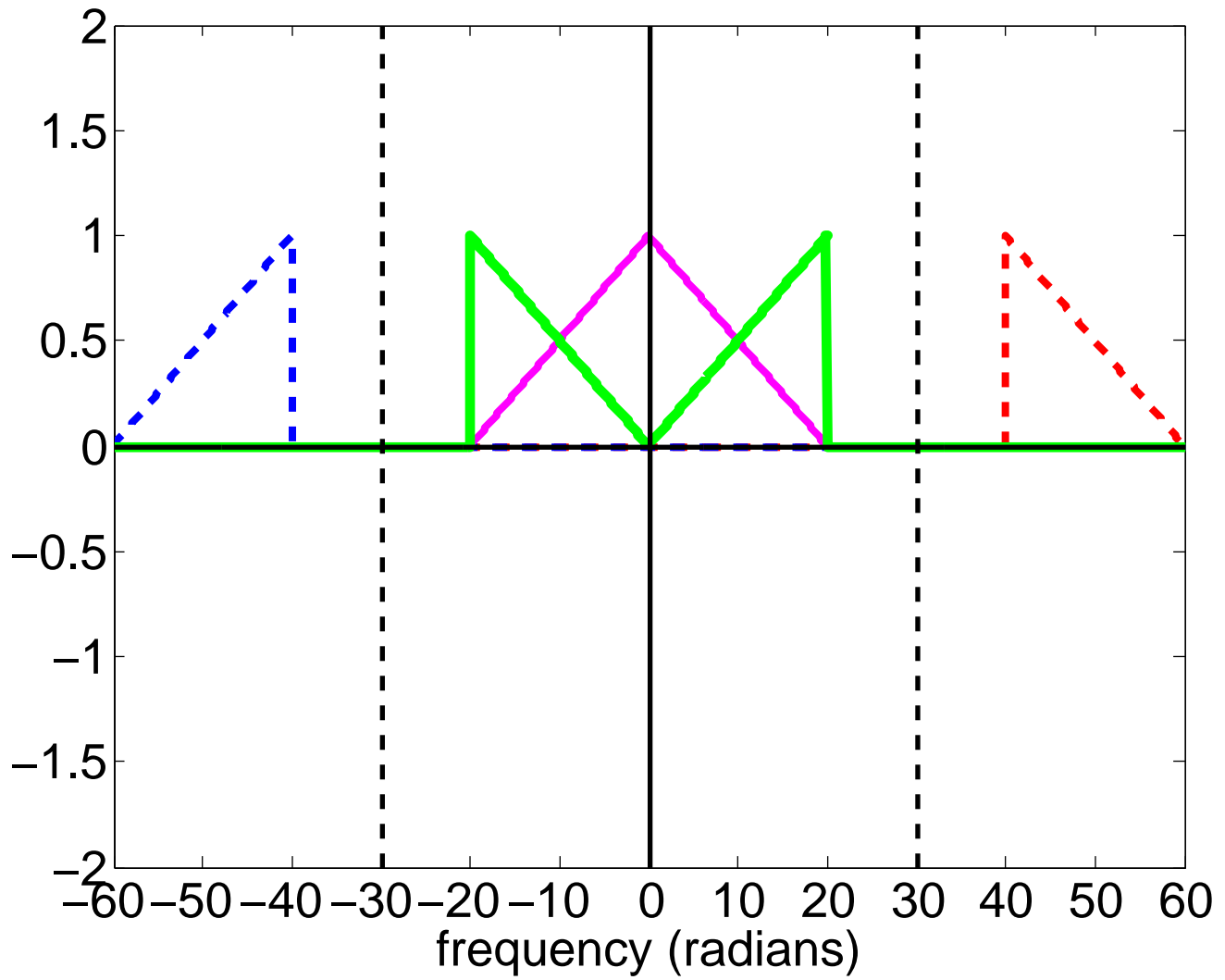
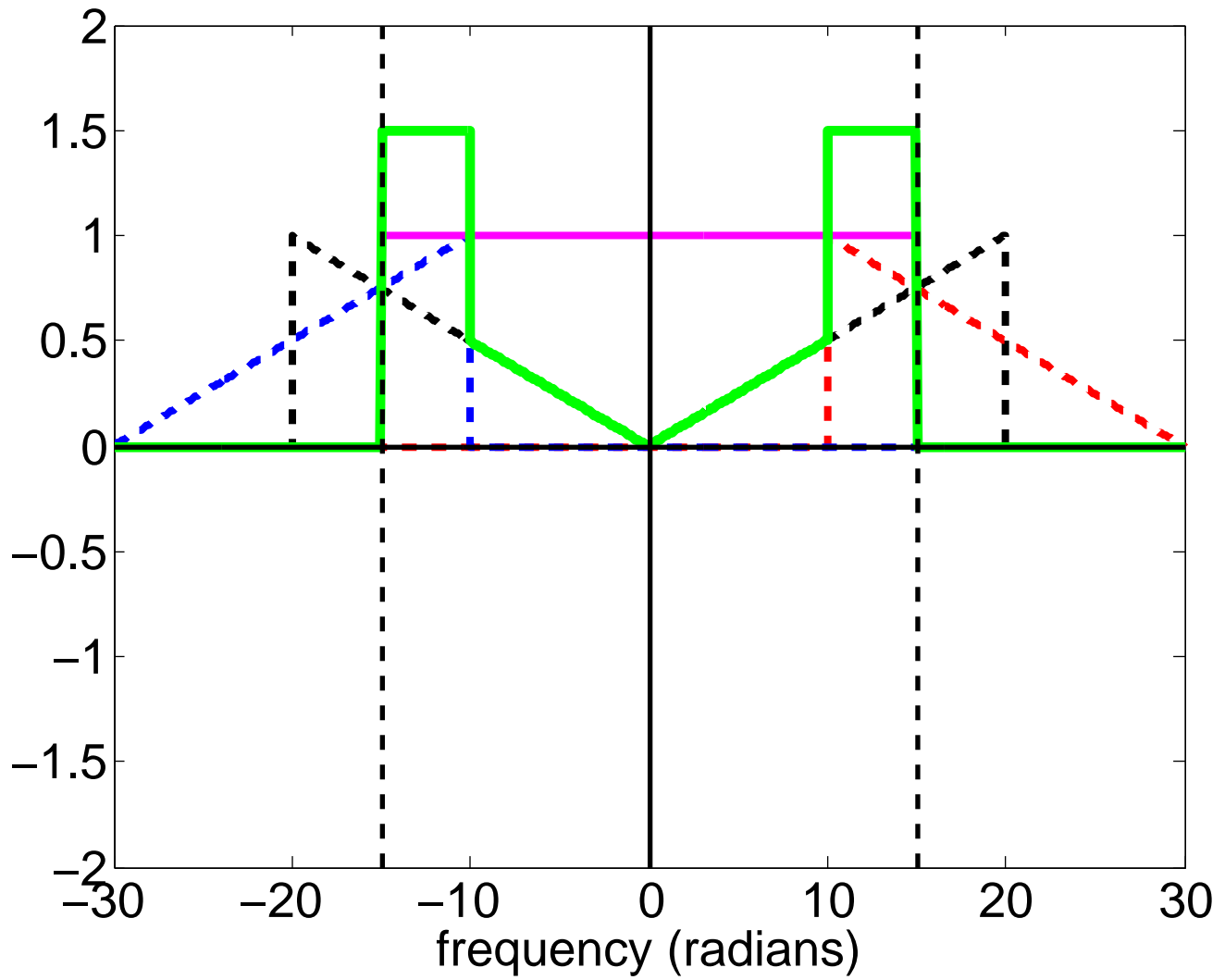3(c) filter distorts signal over original frequency band: NOT perfect reconstruction

frequency (radians)

3(d) meets all three criteria for perfect reconstruction

frequency (radians)
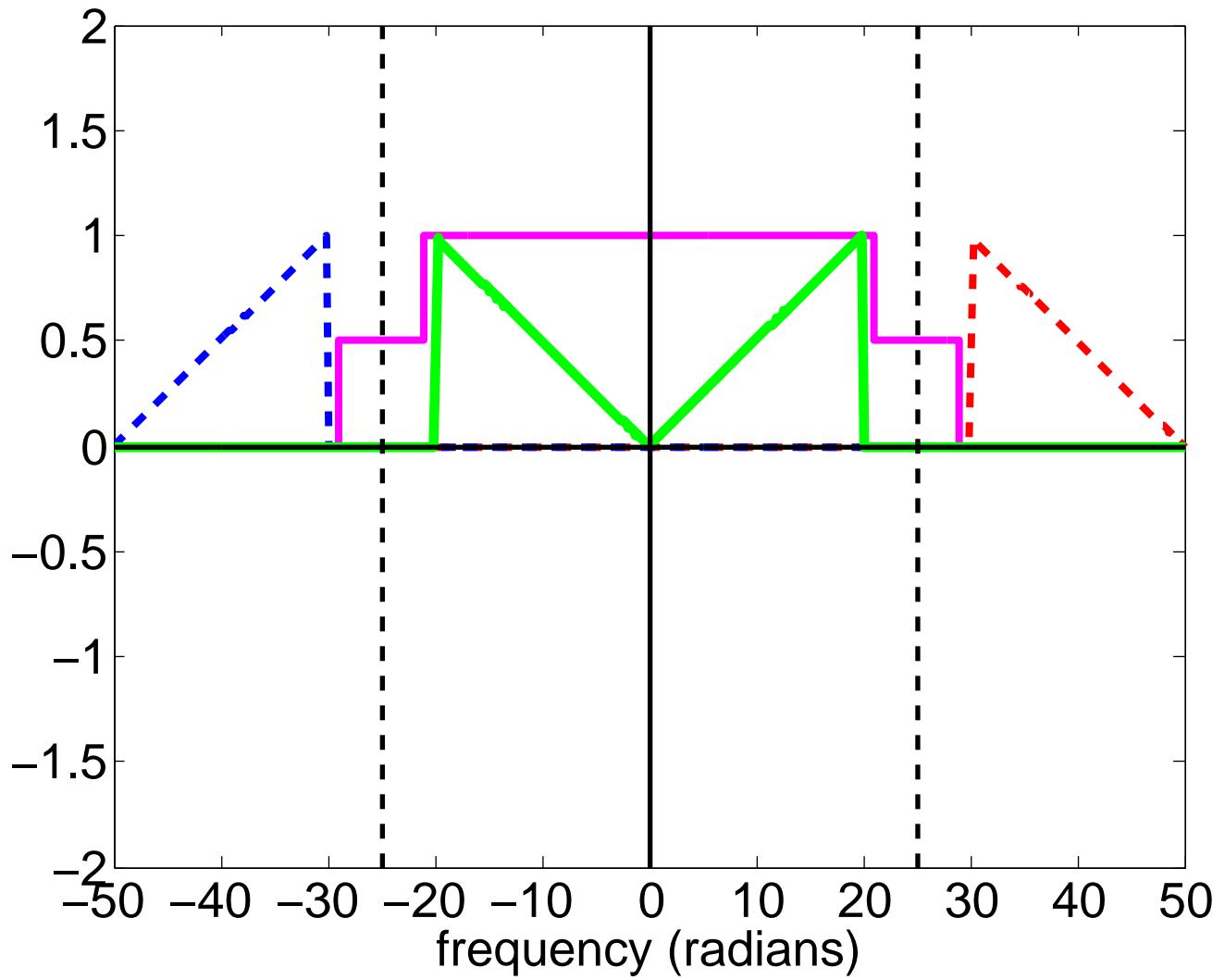
3(e) meets all three criteria for perfect reconstruction
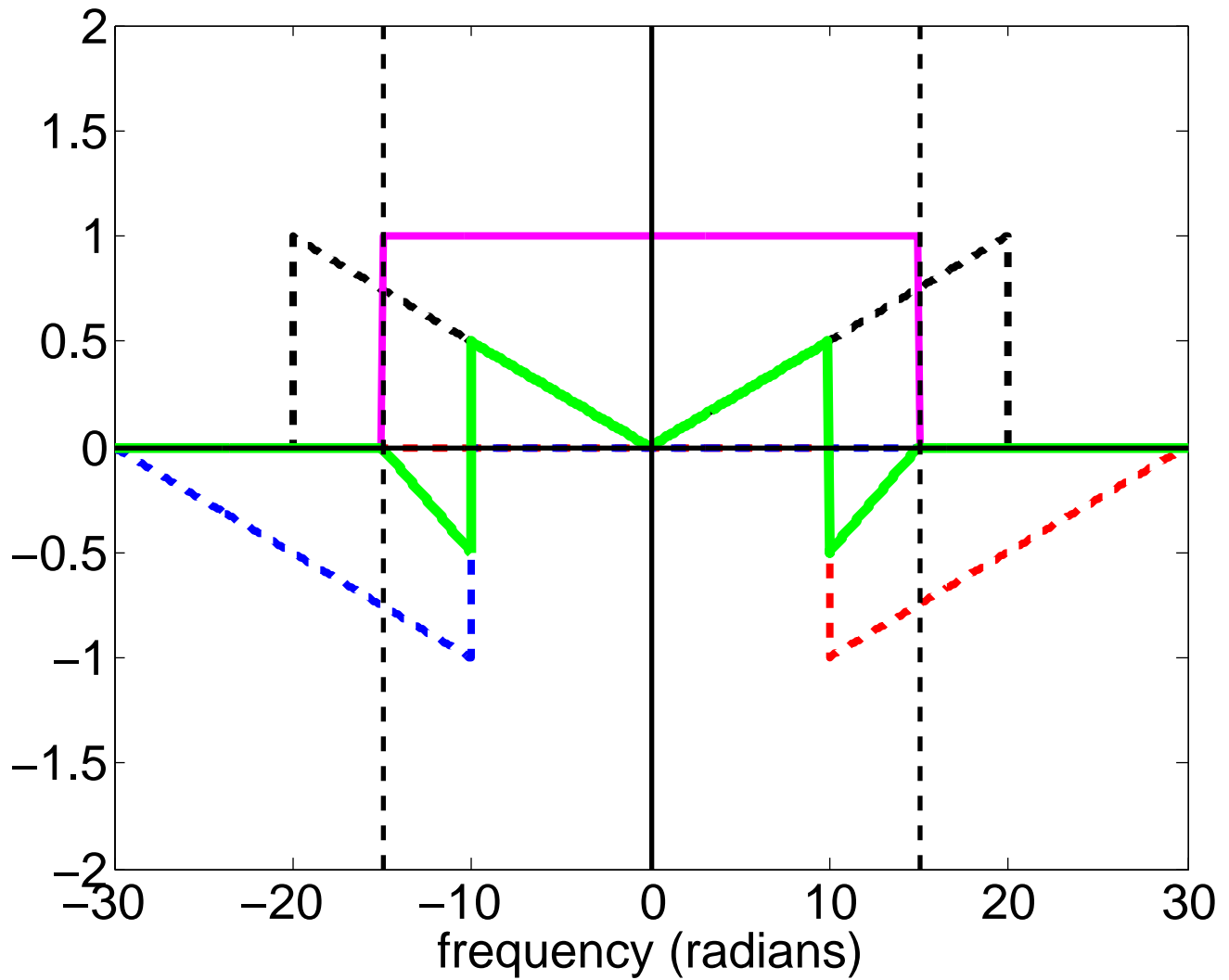
frequency (radians)

3(f) meets all three criteria for perfect reconstruction

frequency (radians)

3(g) sampling rate below Nyquist rate: Aliasing! NOT perfect reconstruction

still need to express reconstructed signal

3(h) sampling rate below Nyquist rate: Aliasing! NOT perfect reconstruction

half sample offset causes the replicas centered at the sampling rate and the negative of the sampling rate to be flipped in sign in contrast to part 3(g)

still need to express reconstructed signal