Fourier Pairs for ECE 315 Test 9 F04

$$(5/2)\text{rect}(t/2) * \text{comb}(t) \overset{\mathcal{F}}{\longleftrightarrow} 5\,\text{sinc}(2f)\,\text{comb}(f) = 5\sum_{k=-\infty}^{\infty} \text{sinc}(2k)\,\delta(f-k)$$

$$8\delta(3(t+1)) - 8\delta(3(t-1)) \overset{\mathcal{F}}{\longleftrightarrow} j(16/3)\sin(2\pi f)$$

$$8\,\text{comb}(3t-1) \overset{\mathcal{F}}{\longleftrightarrow} (8/3)\,\text{comb}(f/3)\,e^{-j2\pi f/3}$$

$$8\,\text{comb}(3(t-1)) \overset{\mathcal{F}}{\longleftrightarrow} (8/3)\,\text{comb}(f/3)\,e^{-j2\pi f} = 8\sum_{k=-\infty}^{\infty} e^{-j6\pi k}\,\delta(f-3k)$$

$$8\delta(3t-1) + 8\delta(3t+1) \overset{\mathcal{F}}{\longleftrightarrow} (16/3)\cos(2\pi f/3)$$

$$8\delta((t-1)/3) + 8\delta((t-1)/3) = 48\delta(t-1) \overset{\mathcal{F}}{\longleftrightarrow} 48e^{-j2\pi f}$$

$$(5/2)\text{rect}(t) * \text{comb}((t-1)/2) \overset{\mathcal{F}}{\longleftrightarrow} 5\,\text{sinc}(f)\,\text{comb}(2f)\,e^{-j2\pi f}$$

$$8\,\text{comb}((t/3)-1) \overset{\mathcal{F}}{\longleftrightarrow} 24\,\text{comb}(3f)\,e^{-j6\pi f}$$

$$(5/2)\text{rect}((t-1)/2) * \text{comb}(t) \overset{\mathcal{F}}{\longleftrightarrow} 5\,\text{sinc}(2f)\,e^{-j2\pi f}\,\text{comb}(f) = 5\sum_{k=-\infty}^{\infty} \text{sinc}(2k)\,e^{-j2\pi k}\,\delta(f-k)$$

$$8\delta((t/3)-1) - 8\delta((t/3)+1) \overset{\mathcal{F}}{\longleftrightarrow} 24\left(e^{-j6\pi f} - e^{+j6\pi f}\right) = -j48\sin(6\pi f)$$

$$8\,\text{comb}((t-1)/3) \overset{\mathcal{F}}{\longleftrightarrow} 24\,\text{comb}(3f)\,e^{-j2\pi f} = 8\sum_{k=-\infty}^{\infty} e^{-j2\pi k/3}\,\delta(f-k/3)$$

$$5\,\text{rect}(t) * (1/2)\,\text{comb}(t/2) \overset{\mathcal{F}}{\longleftrightarrow} 5\,\text{sinc}(f)\,\text{comb}(2f)$$