$$u(t) = m(t)c(t) = Am(t)\cos(2\pi 4\times 10^3 t)$$

$$= A\left[2\cos(2\pi \frac{200}{\pi} t) + 4 \ \sin(2\pi \frac{250}{\pi} t + \frac{\pi}{3}) \right]\cos(2\pi 4\times 10^3 t)$$

$$= A\cos\left(2\pi(4\times 10^3 + \frac{200}{\pi})t \right) + A\cos\left(2\pi(4\times 10^3 - \frac{200}{\pi})t \right)$$

$$+2A\sin\left(2\pi(4\times 10^3 + \frac{250}{\pi})t + \frac{\pi}{3} \right) - 2A\sin\left(2\pi(4\times 10^3 - \frac{250}{\pi})t - \frac{\pi}{3} \right)$$

Για να συνεχίσουμε, το δύσκολο σημείο είναι τα ημίτονα.
Λαμβάνοντας υπ' όψη ότι sin t = cos (π/2 - t), -sin t = sin(-t) και ότι cos t = 1/2 e ^{jt} + 1/2 e $^{-jt}$ έχομε:

$$2A\sin\left(2\pi(4\times 10^3 + \frac{250}{\pi})t + \frac{\pi}{3} \right) - 2A\sin\left(2\pi(4\times 10^3 - \frac{250}{\pi})t - \frac{\pi}{3} \right) =$$

$$2A\cos\left(\frac{\pi}{2} - 2\pi(4\times 10^3 + \frac{250}{\pi})t - \frac{\pi}{3} \right) + 2A\cos\left(\frac{\pi}{2} + 2\pi(4\times 10^3 - \frac{250}{\pi})t - \frac{\pi}{3} \right) =$$

$$2A\cos\left(\frac{\pi}{6} - 2\pi(4\times 10^3 + \frac{250}{\pi})t \right) + 2A\cos\left(\frac{\pi}{6} + 2\pi(4\times 10^3 - \frac{250}{\pi})t \right) =$$

$$A e^{j\left((\pi/6) - 2\pi(4\times 10^3 + (250/\pi))t\right)} + A e^{-j\left((\pi/6) - 2\pi(4\times 10^3 + (250/\pi))t\right)}$$

$$+A e^{j\left((\pi/6) + 2\pi(4\times 10^3 - (250/\pi))t\right)} + A e^{-j\left((5\pi/6) + 2\pi(4\times 10^3 - (250/\pi))t\right)} =$$

$$A e^{j(\pi/6)}\, e^{-j\left(2\pi(4\times 10^3 + (250/\pi))t\right)} + A e^{-j(\pi/6)}\, e^{j\left(2\pi(4\times 10^3 + (250/\pi))t\right)}$$

$$+A e^{j(\pi/6)}\, e^{j\left(2\pi(4\times 10^3 - (250/\pi))t\right)} + A e^{-j(\pi/6)}\, e^{-j\left(2\pi(4\times 10^3 - (250/\pi))t\right)}$$

Οπότε ο MF δίνει:

$$A e^{j(\pi/6)}\,\delta\left(f + (4\times 10^3 + \frac{250}{\pi}) \right) + A e^{-j(\pi/6)}\,\delta\left(f - (4\times 10^3 + \frac{250}{\pi}) \right)$$

$$+A e^{j(\pi/6)}\,\delta\left(f - (4\times 10^3 - \frac{250}{\pi}) \right) + A e^{-j(\pi/6)}\,\delta\left(f + (4\times 10^3 - \frac{250}{\pi}) \right) =$$

$$A e^{j(\pi/6)}\,\delta\left(f + 4\times 10^3 + \frac{250}{\pi} \right) + A e^{-j(\pi/6)}\,\delta\left(f - 4\times 10^3 - \frac{250}{\pi} \right)$$

$$+A e^{j(\pi/6)}\,\delta\left(f - 4\times 10^3 + \frac{250}{\pi} \right) + A e^{-j(\pi/6)}\,\delta\left(f + 4\times 10^3 - \frac{250}{\pi} \right)$$

Λάβαμε υπ' όψη ότι MF του A*e* $^{j2\pi f_0 t}$ → Αδ(f –f_0)