DEPARTAMENTO DE MATEMÁTICA
ESCOLA SUPERIOR DE TECNOLOGIA DE VISEU

# TABELA 3

## Transformadas de Fourier

| | $f(t)$ | $F(z)$ |
|---|---|---|
| 1. | $\delta(t)$ | $1$ |
| 2. | $\delta(t-a)$ | $e^{-ia\omega}$ |
| 3. | $u(t)$ | $\pi\delta(\omega)+\dfrac{1}{i\omega}$ |
| 4. | $1$ | $2\pi\delta(\omega)$ |
| 5. | $\operatorname{sgn}(t)$ | $\dfrac{2}{i\omega}$ |
| 6. | $e^{i\omega_0 t}$ | $2\pi\delta(\omega-\omega_0)$ |
| 7. | $\cos\omega_0 t$ | $\pi\left(\delta(\omega-\omega_0)+\delta(\omega+\omega_0)\right)$ |
| 8. | $\sin\omega_0 t$ | $\dfrac{\pi}{i}\left(\delta(\omega-\omega_0)-\delta(\omega+\omega_0)\right)$ |
| 9. | $\operatorname{rect}(t/a)$ | $a\operatorname{sinc}(\omega a/2)$ |
| 10. | $\cos(\omega_0 t)u(t)$ | $\dfrac{\pi}{2}\left(\delta(\omega-\omega_0)+\delta(\omega+\omega_0)\right)+\dfrac{i\omega}{\omega_0^2-\omega^2}$ |
| 11. | $\sin(\omega_0 t)u(t)$ | $\dfrac{\pi}{2i}\left(\delta(\omega-\omega_0)-\delta(\omega+\omega_0)\right)+\dfrac{\omega}{\omega_0^2-\omega^2}$ |
| 12. | $\operatorname{rect}(t/a)\cos(\omega_0 t)$ | $\dfrac{a}{2}\left(\operatorname{sinc}\dfrac{(\omega-\omega_0)a}{2}+\operatorname{sinc}\dfrac{(\omega+\omega_0)a}{2}\right)$ |
| 13. | $\dfrac{b}{\pi}\operatorname{sinc}(bt)$ | $\operatorname{rect}(\omega/2b)$ |
| 14. | $e^{-at}u(t)$, $\operatorname{Re}(a)>0$ | $\dfrac{1}{a+i\omega}$ |
| 15. | $t^{n-1}e^{-at}u(t)$, $\operatorname{Re}(a)>0$ | $\dfrac{(n-1)!}{(a+i\omega)^n}$ |
| 16. | $e^{-a\lvert t\rvert}$, $\operatorname{Re}(a)>0$ | $\dfrac{2a}{a^2+\omega^2}$ |
| 17. | $e^{-t^2}$ | $\sqrt{\pi}\,e^{-\omega^2/4}$ |
| 18. | $\dfrac{1}{\sqrt{\lvert t\rvert}}$ | $\sqrt{\dfrac{2\pi}{\lvert\omega\rvert}}$ |
| 19. | $\dfrac{1}{t^2+a^2}$ | $\dfrac{\pi}{a}\,e^{-a\lvert\omega\rvert}$ |