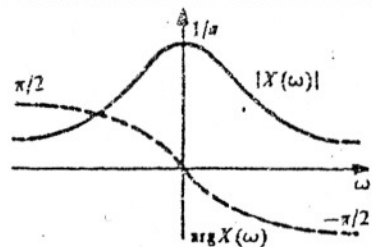
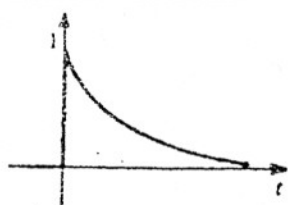


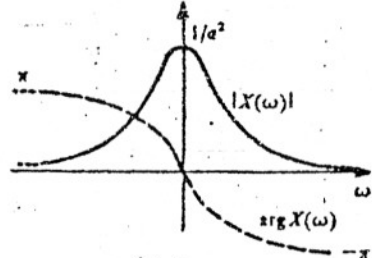
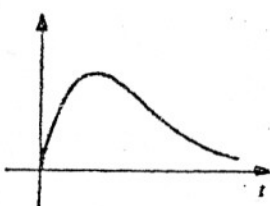
Tabella 3.1. Esempi di spettri

Segnale	Spettro
$A\delta(t)$	$A$
$A$	$2\pi A\delta(\omega)$
$e^{j\omega_0 t}$	$2\pi\delta(\omega - \omega_0)$
$\cos(\omega_0 t + \varphi)$	$\pi[\delta(\omega + \omega_0)e^{j\varphi} + \delta(\omega - \omega_0)e^{-j\varphi}]$
$\sin(\omega_0 t + \varphi)$	$j\pi[-\delta(\omega + \omega_0)e^{j\varphi} + \delta(\omega - \omega_0)e^{-j\varphi}]$
$\sum_{n=-\infty}^{\infty} \mu_n e^{-jn\omega_0 t}$	$2\pi \sum_{n=-\infty}^{\infty} \mu_n \delta(\omega - n\omega_0)$



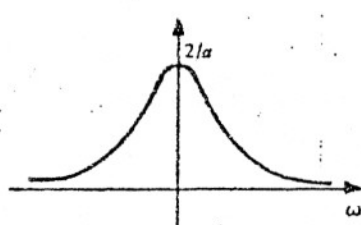
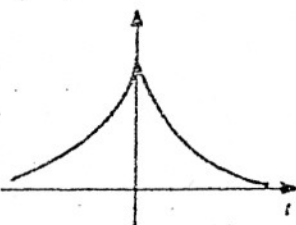
1)  $x(t) = e^{-at}u(t)$

$X(\omega) = \frac{1}{a + j\omega}$



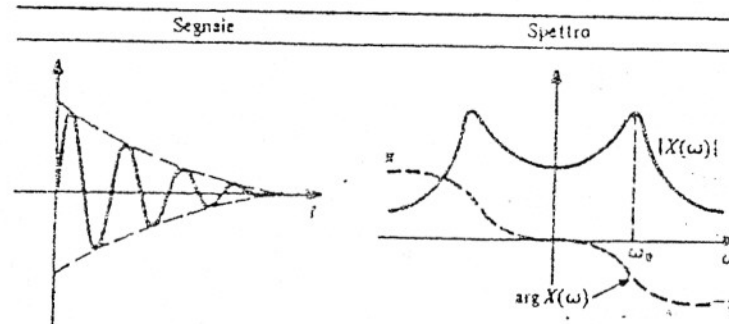
2)  $x(t) = te^{-at}u(t)$

$X(\omega) = \frac{1}{(a + j\omega)^2}$



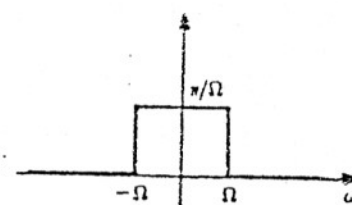
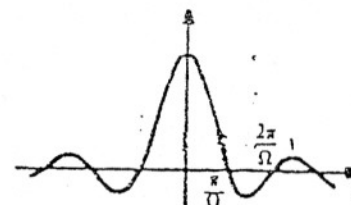
3)  $x(t) = e^{-a|t|}$

$X(\omega) = \frac{2a}{a^2 + \omega^2}$



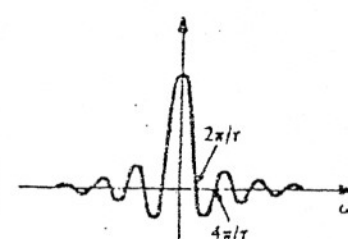
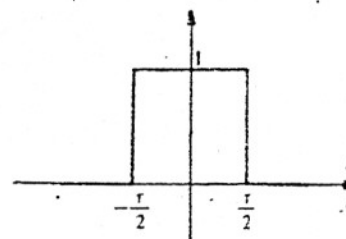
4)  $x(t) = e^{-at} \sin \omega_0 t u(t)$

$X(\omega) = \frac{\omega_0}{(a + j\omega)^2 + \omega_0^2} \quad a > 0$



5)  $x(t) = \frac{\sin \Omega t}{\Omega t}$

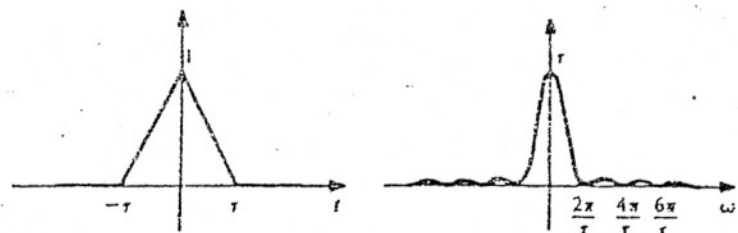
$X(\omega) = \begin{cases} \pi/\Omega & |\omega| < \Omega \\ 0 & \text{altrove} \end{cases}$



6)  $x(t) = \begin{cases} 1 & |t| < r/2 \\ 0 & \text{altrove} \end{cases}$

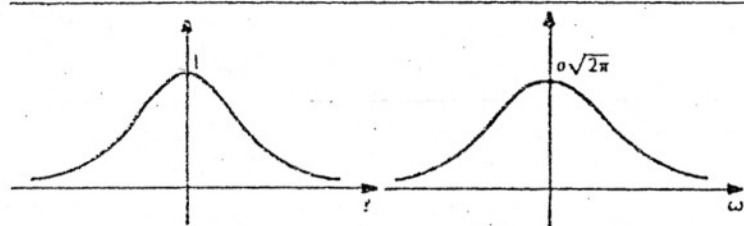
$X(\omega) = r \frac{\sin(\omega r/2)}{\omega r/2}$

Segnale	Spettro
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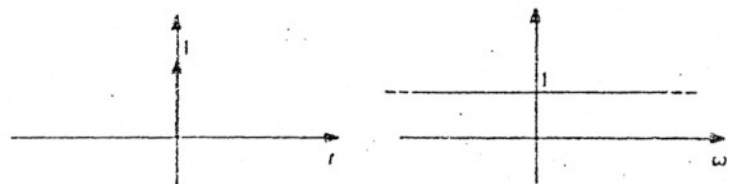
$$7) \quad x(t) = \begin{cases} 1 - \frac{|t|}{\tau} & |t| < \tau \\ 0 & \text{altrove} \end{cases}$$

$$X(\omega) = \tau \left( \frac{\sin \omega \tau / 2}{\omega \tau / 2} \right)^2$$



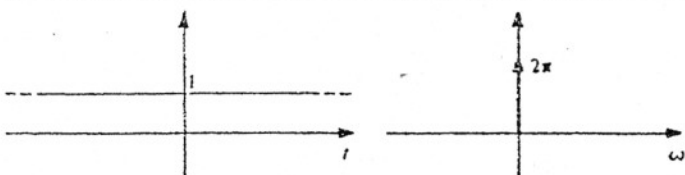
$$8) \quad x(t) = e^{-t^2/2\sigma^2}$$

$$X(\omega) = \sigma\sqrt{2\pi} e^{-\sigma^2\omega^2/2}$$



$$9) \quad x(t) = \delta(t)$$

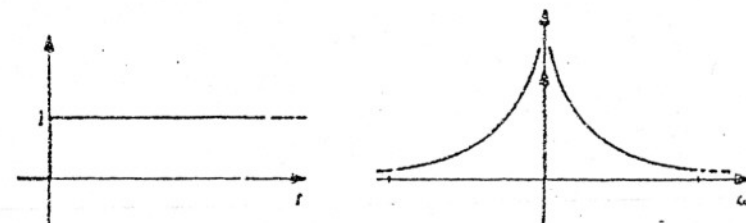
$$X(\omega) = 1$$



$$10) \quad x(t) = 1$$

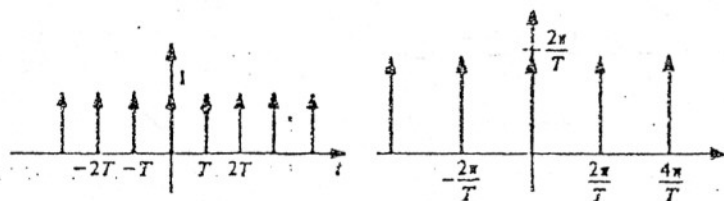
$$X(\omega) = 2\pi\delta(\omega)$$

Segnale	Spettro
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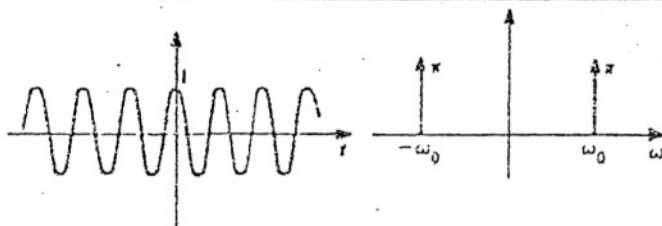
$$11) \quad x(t) = u(t)$$

$$X(\omega) = \frac{1}{j\omega} + \pi\delta(\omega)$$



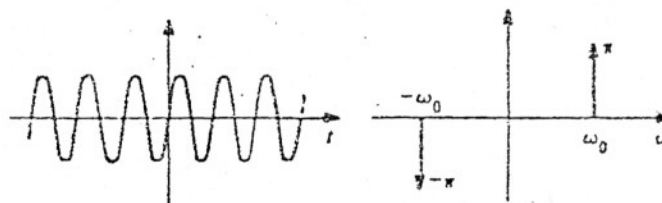
$$12) \quad x(t) = \sum_{k=-\infty}^{\infty} \delta(t - kT)$$

$$X(\omega) = \frac{2\pi}{T} \sum_{k=-\infty}^{\infty} \delta(\omega - k\frac{2\pi}{T})$$



$$13) \quad x(t) = \cos \omega_0 t$$

$$X(\omega) = \pi[\delta(\omega + \omega_0) + \delta(\omega - \omega_0)]$$



$$14) \quad x(t) = \sin \omega_0 t$$

$$X(\omega) = j\pi[-\delta(\omega + \omega_0) + \delta(\omega - \omega_0)]$$