

Fourier Transform of Complex Exponential

What is the Fourier transform of the complex exponential

$$g(t) = e^{j\omega_0 t}$$

1. $\pi\delta(\omega + \omega_0)$
2. $\pi\delta(\omega - \omega_0)$
3. $2\pi\delta(\omega + \omega_0)$
4. $2\pi\delta(\omega - \omega_0)$
5. None of the above
6. Don't know

Fourier Transform of Sinusoid I

What is the Fourier transform of the sinusoidal signal

$$g(t) = \cos(\omega_0 t)$$

1. $\pi [\delta(\omega - \omega_0) - \delta(\omega + \omega_0)]$
2. $\pi [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
3. $2\pi [\delta(\omega - \omega_0) - \delta(\omega + \omega_0)]$
4. $2\pi [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
5. $\frac{\pi}{j} [\delta(\omega - \omega_0) - \delta(\omega + \omega_0)]$
6. $\frac{\pi}{j} [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
7. None of the above
8. Don't know

Fourier Transform of Sinusoid II

What is the Fourier transform of the sinusoidal signal

$$g(t) = \cos(\omega_0 t)\sigma(t)$$

1. $\frac{\omega_0}{a^2 - \omega^2} + \frac{\pi}{2} [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
2. $\frac{\omega_0}{a^2 - \omega^2} + \pi [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
3. $\frac{j\omega}{a^2 - \omega^2} + \frac{\pi}{2} [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
4. $\frac{j\omega}{a^2 - \omega^2} + \pi [\delta(\omega - \omega_0) + \delta(\omega + \omega_0)]$
5. None of the above
6. Don't know