1. Find the Laplace transform: $f(t) = \int_0^t (t-\tau)^4 \cos 6\tau \, d\tau$

2. Find the Laplace transform: $f(t) = \int_0^t \sin(t-\tau) \cos \tau \, d\tau$

3. Find the inverse Laplace transform using the convolution theorem: $\dfrac{s}{(s+1)(s^2+4)}$

4. Find the inverse Laplace transform using the convolution theorem: $\dfrac{3s}{(s^2+9)^2}$