1. Find the Laplace transform of $\int_0^t (t-w)^2 \cos 2w \, dw$.

   Hint: use the fact that $L(f * g) = F(s)G(s)$.

2. Find the inverse Laplace transform of each expression. Your answers should include an integral.

   a. $\dfrac{s}{(s+1)(s^2+4)}$

   b. $\dfrac{G(s)}{s^2+16}$

3. Use Laplace transforms to solve the initial value problem
$y'' + 4y' + 4y = g(t)$; $y(0) = 2$, $y'(0) = -3$.