In[1]:= `c = {-α / (1 - γ^2), -α, -iαγ / (1 - γ^2)}`

Out[1]= $\left\{-\frac{\alpha}{1-\gamma^2}, -\alpha, -\frac{\gamma\, i\alpha}{1-\gamma^2}\right\}$

In[2]:= `c1 = D[c, α]`

Out[2]= $\left\{-\frac{1}{1-\gamma^2}, -1, 0\right\}$

In[3]:= `c2 = D[c, γ]`

Out[3]= $\left\{-\frac{2\,\alpha\,\gamma}{\left(1-\gamma^2\right)^2}, 0, -\frac{2\,\gamma^2\, i\alpha}{\left(1-\gamma^2\right)^2} - \frac{i\alpha}{1-\gamma^2}\right\}$

In[7]:= `α = ωp / ω^2 / (1 + i ν / ω)^2`

Out[7]= $\frac{\omega p}{\left(1+\frac{i\,\nu}{\omega}\right)^2 \omega^2}$

In[8]:= `dα1 = D[α, ω]`

Out[8]= $\frac{2\, i\, \nu\, \omega p}{\left(1+\frac{i\,\nu}{\omega}\right)^3 \omega^4} - \frac{2\,\omega p}{\left(1+\frac{i\,\nu}{\omega}\right)^2 \omega^3}$

In[13]:= `Simplify[dα1]`

Out[13]= $-\frac{2\, i\, \omega p}{\left(\nu - i\,\omega\right)^3}$

In[10]:= `γ = Ω / ω / (1 + iν / ω)`

Out[10]= $\frac{\Omega}{\omega\left(1+\frac{i\nu}{\omega}\right)}$

In[11]:= `dγ1 = D[γ, ω]`

Out[11]= $\frac{\Omega\, i\nu}{\omega^3\left(1+\frac{i\nu}{\omega}\right)^2} - \frac{\Omega}{\omega^2\left(1+\frac{i\nu}{\omega}\right)}$

In[12]:= `Simplify[dγ1]`

Out[12]= $-\frac{\Omega}{\left(\omega + i\nu\right)^2}$