② $y = e^x \cos(x)$

$y' = e^x \cos(x) - e^x \sin(x) = \boxed{e^x \left(\cos(x) - \sin(x) \right)}$

$y'' = e^x \left(\cos(x) - \sin(x) \right) + e^x \left(-\sin(x) - \cos(x) \right)$

$\quad = \boxed{-2e^x \sin(x)}$

$y''' = -2e^x \sin(x) - 2e^x \cos(x)$

$\quad = \boxed{-2e^x \left(\sin(x) + \cos(x) \right)}$

$y^{(4)} = -2e^x \left(\sin(x) + \cos(x) \right) - 2e^x \left(\cos(x) - \sin(x) \right)$

$\quad = \boxed{-4e^x \cos(x)}$

Chapter 23

② $\dfrac{d}{dx} \left[\cos(x^2) \right] = \boxed{-\sin(x^2) \, 2x}$

⑯ $\dfrac{d}{dx} \left[\sqrt{x^2+1} \right] = \dfrac{d}{dx} \left[(x^2+1)^{\frac{1}{2}} \right]$

$\quad = \dfrac{1}{2}(x^2+1)^{-\frac{1}{2}} \, 2x = \dfrac{x}{(x^2+1)^{\frac{1}{2}}} = \boxed{\dfrac{x}{\sqrt{x^2+1}}}$