

sol)

P. 108.

문제 5.2.2)

$$(3) y = \sin^2(x^4)$$

$$y = (\sin(x^4))^2$$

$$= 2 \sin(x^4) \times \cos(x^4) \times 4x^3$$

$$= 8x^3 \sin(x^4) \cos(x^4)$$

$$\frac{dy}{dx} = 8x^3 \sin(x^4) \cos(x^4)$$

(5)

$$y = \cos \sqrt{x+1}$$

$$y' = -\sin \sqrt{x+1} \times (\sqrt{x+1})' = -\frac{1}{2} (\sqrt{x+1})^{-1} \sin(\sqrt{x+1})$$

$$(\sqrt{x+1})' = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{\sqrt{x+h+1} - \sqrt{x+1}}{h}$$

$$= \lim_{h \rightarrow 0} \frac{x+h+1 - x-1}{h(\sqrt{x+h+1} + \sqrt{x+1})}$$

$$= \lim_{h \rightarrow 0} \frac{h}{h(\sqrt{x+h+1} + \sqrt{x+1})} = \frac{1}{2\sqrt{x+1}} = \frac{1}{2} (\sqrt{x+1})^{-1}$$

$$\frac{dy}{dx} = -\frac{1}{2} (\sqrt{x+1})^{-1} \sin(\sqrt{x+1})$$