

03 > 07 KACPER

3. 7.

$$\underline{I}(x) = x + f(x) \cdot g(x)$$

$$\textcircled{1} \quad \underline{I}(\lambda) = \lambda + \underbrace{f(\lambda) \cdot g(\lambda)}_0 = \lambda$$

$$\begin{aligned}
 \underline{I}'(\lambda) &= 1 + f'(\lambda) \cdot g(\lambda) + \underbrace{f(\lambda) \cdot g'(\lambda)}_0 = \\
 &= 1 + f'(\lambda) \cdot g(\lambda) = 0
 \end{aligned}$$

$$\underbrace{g(\lambda)}_{\lambda} = \frac{-1}{f'(\lambda)}$$

$$\begin{aligned}
 \underline{I}''(\lambda) &= f''(\lambda) \cdot g(\lambda) + f'(\lambda) \cdot g'(\lambda) + \\
 &\quad + f'(\lambda) \cdot \underbrace{g'(\lambda)}_0 + \underbrace{f(\lambda) \cdot g''(\lambda)}_0 = 0 \\
 &= 2f'(\lambda) \cdot g'(\lambda) + \frac{f''(\lambda)}{f'(\lambda)} = 0
 \end{aligned}$$

$$g'(\lambda) = \frac{f''(\lambda)}{2(f'(\lambda))^2}$$

$\overbrace{\quad}^{\Phi''(x) = f''(x) \cdot g(x) + 2f'(x) \cdot g'(x) + f(x) \cdot g''(x)}$

$\Phi'''(\lambda) \neq 0$

$$= f'''(\lambda) \cdot g(\lambda) + \underbrace{f''(\lambda) \cdot g'(\lambda)}_{\neq 0} + \underbrace{2f''(\lambda) \cdot g(\lambda) + 2f'(\lambda)g''(\lambda)}_{\text{wenn}} \\ + \underbrace{f'(\lambda) \cdot g''(\lambda) + f(\lambda) \cdot g'''(\lambda)}_{\neq 0} = \\ = 3f''(\lambda) \cdot g'(\lambda) + 3f'(\lambda) \cdot g''(\lambda) + f'''(\lambda) \cdot g(\lambda) \\ \neq 0$$

$$3f''(\lambda) \cdot \frac{f''(\lambda)}{2(f'(\lambda))^2} + 3f'(\lambda) \cdot g''(\lambda) + f'''(\lambda) \cdot \frac{-1}{f'(\lambda)}$$

$$g''(\lambda) \cdot 3f'(\lambda) \neq \frac{f'''(\lambda)}{f'(\lambda)} - \frac{3(f''(\lambda))^2}{2(f'(\lambda))^2}$$

$$g''(\lambda) \neq \frac{2f'''(\lambda)f'(\lambda) - 3(f''(\lambda))^2}{3(f'(\lambda))^3}$$