Example: $h(x) = e^{3x+2} (5x+3)^{12}$

Step 1: Product Rule 1st

$f = e^{3x+2} \quad g = (5x+3)^{12} \quad g' = 12(5x+3)^{11} \cdot 5 \quad g'' = 60(5x+3)^{10}$

$f' = 3e^{3x+2} \quad g' = 12(5x+3)^{11} \cdot 5 \quad f'' = 60(5x+3)^{10}$

$fg' + g'f = 3e^{3x+2}(5x+3)^{12} + 60(5x+3)^{11}(e^{3x+2})$

Step 3: Take out common factors

$3e^{3x+2}(5x+3)^{11} [(5x+3) + 20]$

$3(5x+23)e^{3x+2}(5x+3)^{11} (5x+23)$

Final Answer