I want to define the derivative using $y' = (u \cdot v)'$, where $y = (5x^2 + 9) \cdot (2x^3 + 4)$;

Solution: According to the differentiation product rule for the case of functions $u(x)$ and $v(x)$:

$(u \cdot v)' = u' \cdot v + u \cdot v'$, in our case, $u(x) = 5x^2 + 9$; $u' = (5x^2 + 9)' = 10x$; and $v(x) = 2x^3 + 4$; $v' = (2x^3 + 4)' = 6x^2$;

Then, $y' = [(5x^2 + 9) \cdot (2x^3 + 4)]' = 10x \cdot (2x^3 + 4) + (5x^2 + 9) \cdot 6x^2 = 20x^4 + 40x + 30x^4 + 54x^2 = 50x^4 + 54x^2 + 40x$.

Answer: $y' = 50x^4 + 54x^2 + 40x$.