10. $f(x) = \dfrac{3 + \frac{1}{x}}{x-5}$ ← INNER DENOM

$= \dfrac{x(3) + x\left(\frac{1}{x}\right)}{x(x) - 5(x)}$

$= \dfrac{3x+1}{x^2-5x}$ $\begin{matrix})\, P \\ )\, Q \end{matrix}$ $\begin{matrix} P' = 3 \\ Q' = 2x-5 \end{matrix}$

$\dfrac{P'Q - PQ'}{Q^2}$

$f'(x) = \dfrac{3(x^2-5x) - (3x+1)(2x-5)}{[x^2-5x]^2}$

$= \dfrac{3x^2-15x-(6x^2-15x+2x-5)}{[x(x-5)]^2}$

$= \dfrac{3x^2-15x-(6x^2-13x-5)}{x^2(x-5)^2}$

$= \dfrac{3x^2-15x-6x^2+13x+5}{x^2(x-5)^2}$

$= \dfrac{-3x^2-2x+5}{x^2(x-5)^2}$

$= \dfrac{-(3x^2+2x-5)}{x^2(x-5)^2}$ (KEY #)

$= \dfrac{-(3x+5)(x-1)}{x^2(x-5)^2}$