CHAIN RULE

$$\frac{d}{dx}[u^n] = nu^{n-1} \cdot u'$$

$$\frac{d}{dx}[x^n] = nx^{n-1}$$

1. $y = \left(\frac{3x^5 - 2}{u}\right)^3$

so $u' = 15x^4$

$nu^{n-1}(u')$

$y' = 3(3x^5 - 2)^2 \cdot 15x^4$

$= 3 \cdot 15x^4(3x^5 - 2)^2$

$= \boxed{45x^4(3x^5 - 2)^2}$

2. $f(x) = (5x-3)^{\frac{1}{3}}$

$u = 5x - 3 \quad u' = 5$

$nu^{n-1} \cdot u'$

$f'(x) = \frac{1}{3}(5x-3)^{\frac{1}{3}-1} \cdot 5$

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

$= \boxed{\frac{5}{3(5x-3)^{2/3}}}$

3. $y = \sqrt[5]{7x^2 - 4x + 2}$

$y = (7x^2 - 4x + 2)^{\frac{1}{5}}$

$y' = \frac{1}{5}(7x^2 - 4x + 2)^{\frac{1}{5}-1} \cdot \frac{d}{dx}(7x^2 - 4x + 2)$

$= \frac{1}{5}(7x^2 - 4x + 2)^{-\frac{4}{5}} \cdot (14x - 4)$

$= \frac{14x - 4}{5(7x^2 - 4x + 2)^{4/5}}$

$= \frac{2(7x - 2)}{5(7x^2 - 4x + 2)^{4/5}}$