Q2: $f(x) = \frac{(x^p - 1)}{p}$

$$f'(x) = \frac{p \cdot (p x^{p-1}) - (x^p - 1) \cdot 0}{p^2}$$

$$= \frac{p^2 x^{p-1} - 0}{p^2} = \frac{p^2 x^{p-1}}{p^2} = x^{p-1}$$

Thus if $x = 1$, $f'(x) = x^{p-1} = 1^{p-1} = 1$ regardless of the value of p.