QUOTIENT RULE

$$\frac{d}{dx}\left[\frac{P}{Q}\right] = \frac{P'Q - PQ'}{Q^2}$$

3. $f(x) = \dfrac{x^3-8x+1}{x^2-4}$ $\quad$ $)P$ so $P' = 3x^2-8$ $\quad$ $)Q$ so $Q' = 2x$

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

$$f'(x) = \frac{(3x^2-8)(x^2-4) - (x^3-8x+1)(2x)}{(x^2-4)^2}$$

$$= \frac{3x^4 - 12x^2 - 8x^2 + 32 - (2x^4 - 16x^2 + 2x)}{(x^2-4)^2}$$

$$= \frac{3x^4 - 20x^2 + 32 - 2x^4 + 16x^2 - 2x}{(x^2-4)^2}$$

$$= \boxed{\frac{x^4 - 4x^2 - 2x + 32}{(x^2-4)^2}}$$