

1. Find $f^{(6)}(x)$ for $f(x) = \frac{x+1}{x-1}$.

2. Find $f^{(5)}(x)$ and $f^{(6)}(x)$ for

$$f(x) = (x^3 + 3x^2 + 2x - 1)(x^3 - 2x^2 - 2x + 1).$$

Hint: Take the product prior to differentiation and ignore lower order terms.

3. Find $f^{(6)}(x)$ for $f(x) = ((x+1)^2 + 1)^3$.