The following rules give formulas for computing derivatives of polynomials:

Constant Function Rule: For any constant c,

$$\frac{d}{dx}(c) = 0 \quad \text{i.e.} \quad c' = 0$$

Power Rule: For any number n except $n = 0$,

$$\frac{d}{dx}(x^n) = nx^{n-1} \quad \text{i.e.} \quad (x^n)' = nx^{n-1}$$

Sum Rule: For any two functions f and g,

$$\frac{d}{dx}(f+g) = \frac{d}{dx}f + \frac{d}{dx}g \quad \text{i.e.} \quad (f+g)' = f' + g'$$

Difference Rule: For any two functions f and g,

$$\frac{d}{dx}(f-g) = \frac{d}{dx}f - \frac{d}{dx}g \quad \text{i.e.} \quad (f-g)' = f' - g'$$

Constant Multiple Rule: For any function f and any constant c,

$$\frac{d}{dx}(cf) = c\,\frac{d}{dx}f \quad \text{i.e.} \quad (cf)' = c\,f'$$

WARNING: Products and quotients are not as nice. For example:

$$(fg)' \neq f'\,g' \quad \text{and} \quad \left(\frac{f}{g}\right)' \neq \frac{f'}{g'}.$$