Exercise 8

Differentiate.

$$G(x) = \frac{x^2 - 2}{2x + 1}$$

Solution

Use the quotient rule to differentiate $G(x)$.

$$\begin{aligned} G'(x) &= \frac{d}{dx}\left(\frac{x^2 - 2}{2x + 1}\right) \\ &= \frac{\left[\frac{d}{dx}(x^2 - 2)\right](2x + 1) - \left[\frac{d}{dx}(2x + 1)\right](x^2 - 2)}{(2x + 1)^2} \\ &= \frac{(2x)(2x + 1) - (2)(x^2 - 2)}{(2x + 1)^2} \\ &= \frac{2x^2 + 2x + 4}{(2x + 1)^2} \end{aligned}$$