

Calculus I, Section 3.2, #16
The Product and Quotient Rules

Differentiate.¹

$$y = \frac{1}{t^3 + 2t^2 - 1}$$

This function is a quotient, so we'll use quotient rule.

$$y = \frac{1}{t^3 + 2t^2 - 1}$$

then

$$\begin{aligned} \frac{dy}{dt} &= \frac{(t^3 + 2t^2 - 1) \cdot 0 - 1 \cdot (3t^2 + 4t)}{(t^3 + 2t^2 - 1)^2} \\ &= \frac{-3t^2 - 4t}{(t^3 + 2t^2 - 1)^2} \end{aligned}$$

or

$$= -\frac{3t^2 + 4t}{(t^3 + 2t^2 - 1)^2}$$

¹Stewart, *Calculus, Early Transcendentals*, p. 188, #16.