

Exercise 62

Find $f'(x)$. Check that your answer is reasonable by comparing the graphs of f and f' .

$$f(x) = \arctan(x^2 - x)$$

Solution

Use the chain rule and the derivatives of the inverse trigonometric functions listed on page 214.

$$\begin{aligned}\frac{df}{dx} &= \frac{d}{dx} \arctan(x^2 - x) \\ &= \frac{1}{1 + (x^2 - x)^2} \cdot \frac{d}{dx}(x^2 - x) \\ &= \frac{1}{1 + (x^4 - 2x^3 + x^2)} \cdot (2x - 1) \\ &= \frac{2x - 1}{x^4 - 2x^3 + x^2 + 1}\end{aligned}$$

