

For all problems, calculate  $f'(x)$ . Simplify your answers.

1)

$$f(x) = \sec^{-1}\left(\frac{1}{\sqrt{x}}\right), \quad 0 < x < 1$$

2)

$$f(x) = \tan^{-1}\left(\frac{7}{x^2}\right)$$

3)

$$f(x) = (x^4 - 4x^3 + 12x^2 - 24x + 24)e^x$$

4)

$$f(x) = \frac{4x + 7}{5^x}$$

5)

$$f(x) = \frac{\log_4 x}{x^5}, \quad x > 0$$

6)

$$f(x) = x \cot^{-1} x + \ln \sqrt{1 + x^2}$$

7)

$$f(x) = \frac{\ln|x^3 - 8|}{x}$$

8)

$$f(x) = \frac{3x^2 - 5x - 28}{|x - 4|}$$

9)

$$f(x) = x^{7x}$$

10)

$$f(x) = (9x)^{2x}$$