

Worksheet: Differentiation rules

Compute the derivatives using the differentiation rules, especially the product, quotient, and chain rules. *Do* simplify your answers so we can compare results.

1.

$$f(x) = \frac{2x^2 - k}{c + x^3} \quad \text{where } c \text{ and } k \text{ are constant}$$

2.

$$y = \frac{2(2 - \sin x)}{\cos x}$$

3.

$$f(x) = (7 + x^3)^5$$

4.

$$y = \ln \left(\frac{1 + e^x}{1 - e^x} \right)$$

2

5.

$$h(x) = \sec(3^{\tan x})$$

6.

$$g(t) = \sqrt{\frac{t}{t-2}}$$

7. Find the first and second derivatives:

$$f(s) = e^s \sin(s^2)$$