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.

$$f(x) = (x^4 + 1)(x - x^2)$$

2.

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

3.

$$f(x) = \left(4 + x^7\right)^5$$

4.

$$f(x) = \frac{2x^2 - k}{c + x^3}$$

5.

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

6. Find the first and second derivatives:

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