

Calculus I

Extra Chain Rule problems

Compute all of the following derivatives in terms of the unspecified function f and its derivatives. For example, the derivative of $f(x^2)$ is $2xf'(x^2)$, just as the derivative of $\sin(x^2)$ is $2x \cos(x^2)$.

1.

$$f(x^3 + 1)$$

2.

$$f(\tan \theta)$$

3.

$$f\left(\frac{1}{x}\right)$$

4.

$$f^2(t) + f'^2(t)$$

5.

$$\ln(f(x))$$

6.

$$\sqrt{f(x)}$$

7.

$$e^{f(x)}$$

8.

$$(\sin x) f(e^{x^2})$$

9.

$$\frac{f(x^2)}{\sqrt{1+x^2}}$$

10.

$$\sin(f(\cos s))$$