

Differentiation Rules Review

1. $\frac{d}{dx}[f \pm g] = f' \pm g'$
2. $\frac{d}{dx}[fg] = f'g + fg'$ Product Rule
3. $\frac{d}{dx}\left[\frac{f}{g}\right] = \frac{f'g - fg'}{g^2}$ Quotient Rule
4. $\frac{d}{dx}[cf] = c \cdot \frac{d}{dx}[f]$
5. $\frac{d}{dx}[f[g(x)]] = f'[g(x)]g'(x)$ Chain Rule
6. $\frac{d}{dx}[c] = 0$
7. $\frac{d}{dx}[x^n] = nx^{n-1}$ Power Rule
8. $\frac{d}{dx}[e^x] = e^x$
9. $\frac{d}{dx}[a^x] = a^x \ln a$
10. $\frac{d}{dx}[\ln |x|] = \frac{1}{x}$
11. $\frac{d}{dx}[\log_a x] = \frac{1}{x \ln a}$
12. $\frac{d}{dx}[\sin x] = \cos x$
13. $\frac{d}{dx}[\cos x] = -\sin x$
14. $\frac{d}{dx}[\tan x] = \sec^2 x$
15. $\frac{d}{dx}[\cot x] = -\csc^2 x$
16. $\frac{d}{dx}[\sec x] = \sec x \tan x$
17. $\frac{d}{dx}[\csc x] = -\csc x \cot x$
18. $\frac{d}{dx}[\sin^{-1} x] = \frac{1}{\sqrt{1-x^2}}$
19. $\frac{d}{dx}[\cos^{-1} x] = \frac{-1}{\sqrt{1-x^2}}$
20. $\frac{d}{dx}[\tan^{-1} x] = \frac{1}{1+x^2}$