

# Derivative Rules

*This handout contains the derivative rule patterns.*

Let  $f$  and  $g$  be functions and let  $k$  be a constant.

$$1. \frac{d}{dv} k = 0$$

$$2. \frac{d}{dv} v = 1$$

$$3. \frac{d}{dv} f^k = k f^{k-1} \cdot \frac{df}{dv}$$

$$4. \frac{d}{dv} (k \cdot f) = k \cdot \frac{df}{dv}$$

$$5. \frac{d}{dv} (f \pm g) = \frac{df}{dv} \pm \frac{dg}{dv}$$

$$6. \frac{d}{dv} (f \cdot g) = \frac{df}{dv} \cdot g + f \cdot \frac{dg}{dv}$$

$$7. \frac{d}{dv} \left( \frac{f}{g} \right) = \frac{\frac{df}{dv} \cdot g - f \cdot \frac{dg}{dv}}{g^2}$$

$$8. \frac{d}{dv} e^f = e^f \cdot \frac{df}{dv}$$

$$9. \frac{d}{dv} \ln(f) = \frac{1}{f} \cdot \frac{df}{dv}$$

$$10. \frac{d}{dv} \sin(f) = \cos(f) \cdot \frac{df}{dv}$$

$$11. \frac{d}{dv} \cos(f) = -\sin(f) \cdot \frac{df}{dv}$$

$$12. \frac{d}{dv} \tan(f) = \sec^2(f) \cdot \frac{df}{dv}$$

$$13. \frac{d}{dv} \csc(f) = -\csc(f) \cot(f) \cdot \frac{df}{dv}$$

$$14. \frac{d}{dv} \sec(f) = \sec(f) \tan(f) \cdot \frac{df}{dv}$$

$$15. \frac{d}{dv} \cot(f) = -\csc^2(f) \cdot \frac{df}{dv}$$

$$16. \frac{d}{dv} \arcsin(f) = \frac{1}{\sqrt{1-f^2}} \cdot \frac{df}{dv}$$

$$17. \frac{d}{dv} \arctan(f) = \frac{1}{1+f^2} \cdot \frac{df}{dv}$$

$$18. \frac{d}{dv} \operatorname{arcsec}(f) = \frac{1}{f \cdot \sqrt{f^2-1}} \cdot \frac{df}{dv}$$

$$19. \frac{d}{dv} \arccos(f) = -\frac{d}{dv} \arcsin(f)$$

$$20. \frac{d}{dv} \operatorname{arccot}(f) = -\frac{d}{dv} \arctan(f)$$

$$21. \frac{d}{dv} \operatorname{arccsc}(f) = -\frac{d}{dv} \operatorname{arcsec}(f)$$