Differentiation of Trigonometric Functions

1) $\frac{d}{dx}(Sinx) = Cosx \frac{d}{dx}(x)$

2) $\frac{d}{dx}(Cosx) = -Sinx \frac{d}{dx}(x)$

3) $\frac{d}{dx}(tanx) = Sec^2x \frac{d}{dx}(x)$

4) $\frac{d}{dx}(Cotx) = -Cosec^2x \frac{d}{dx}(x)$

5) $\frac{d}{dx}(Secx) = Secx.tanx \frac{d}{dx}(x)$

6) $\frac{d}{dx}(Cesecx) = -Cosecx.Cotx \frac{d}{dx}(x)$

Differentiation of Inverse Trigonometric Functions

1) $\frac{d}{dx}(Sin^{-1}x) = \frac{1}{\sqrt{1-x^2}} \frac{d}{dx}(x)$

2) $\frac{d}{dx}(Cos^{-1}x) = \frac{-1}{\sqrt{1-x^2}} \frac{d}{dx}(x)$

3) $\frac{d}{dx}(tan^{-1}x) = \frac{1}{1+x^2} \frac{d}{dx}(x)$

4) $\frac{d}{dx}(Cot^{-1}x) = \frac{-1}{1+x^2} \frac{d}{dx}(x)$

5) $\frac{d}{dx}(Sec^{-1}x) = \frac{1}{|x|\sqrt{x^2-1}} \frac{d}{dx}(x)$

6) $\frac{d}{dx}(Cosec^{-1}x) = \frac{-1}{|x|\sqrt{x^2-1}} \frac{d}{dx}(x)$

Differentiation of Hyperbolic Functions

1) $\frac{d}{dx}(Sinhx) = Coshx \frac{d}{dx}(x)$

2) $\frac{d}{dx}(Coshx) = Sinhx \frac{d}{dx}(x)$

3) $\frac{d}{dx}(tanhx) = Sech^2x \frac{d}{dx}(x)$

4) $\frac{d}{dx}(Cothx) = -Cosech^2x \frac{d}{dx}(x)$

5) $\frac{d}{dx}(Sechx) = -Sechx.tanhx \frac{d}{dx}(x)$

6) $\frac{d}{dx}(Cosechx) = -Cosechx.cothx \frac{d}{dx}(x)$

Differentiation of Inverse Hyperbolic Functions

1) $\frac{d}{dx}(Sinh^{-1}x) = \frac{1}{\sqrt{1+x^2}} \frac{d}{dx}(x)$

2) $\frac{d}{dx}(Cosh^{-1}x) = \frac{1}{\sqrt{x^2-1}} \frac{d}{dx}(x)$

3) $\frac{d}{dx}(tanh^{-1}x) = \frac{1}{1-x^2} \frac{d}{dx}(x)$

4) $\frac{d}{dx}(Coth^{-1}x) = \frac{-1}{x^2-1} \frac{d}{dx}(x)$

5) $\frac{d}{dx}(Sech^{-1}x) = \frac{-1}{|x|\sqrt{1-x^2}} \frac{d}{dx}(x)$

6) $\frac{d}{dx}(Cosech^{-1}x) = \frac{-1}{|x|\sqrt{x^2+1}} \frac{d}{dx}(x)$