Here are the most-used Derivative Rules, mostly derived from the Natural Log (Ln) & Constant Rules, which are assumed (y’=dy/dx : x’=dx/dx=1)

y=ln(x)
dy=dx/x
y’=x’/x
Natural Log (Ln) Rule

y=c
y’=0
Constant Rule

y=$\log_a$(x)
y=$\log_a$(x=a^z)
y=z*$\log_a$(a)
y=z
dy=dz
dx=ln(a)a^zdz
dx=ln(a)xdy
dy=dx/[x*ln(a)]
y’=1/[x*ln(a)]
Log Rule

y=a+b
ln(y)=ln(a+b)
dy/y=(da+db)/(a+b)
dy=y(da+db)/(a+b)
dy=(a+b)(da+db)/(a+b)
dy=(da+db)
y’=a’+b’
Sum Rule

y=a-b
ln(y)=ln(a-b)
dy/y=(da-db)/(a-b)
dy=y(da-db)/(a-b)
dy=(a-b)(da-db)/(a-b)
dy=(da-db)
y’=a’-b’
Difference Rule

y=ab
ln(y)=ln(ab)=ln(a)+ln(b)
dy/y=da/a+db/b
dy=y[da/a+db/b]
dy=(ab)[da/a+db/b]
dy=(b)da+(a)db
y’=(b)a’+(a)b’
Product Rule

y=cx (Special case: c=constant)
y’=(x)c’+(c)x’
y’=(x)(0)+(c)x’
y’=(c)x’
Constant*Function Rule

y=a/b
ln(y)=ln(a/b)=ln(a)-ln(b)
dy/y=da/a-db/b
dy=y[da/a-db/b]
dy=(a/b)[da/(a)-db/(b)]
dy=[da/(b)-(a)db/(b^2)]
dy=[(b)da/(b^2)-(a)db/(b^2)]
dy=[(b)da-(a)db]/b^2
y’=[(b)a’-(a)b’]/b^2
Quotient Rule

y=a^b
ln(y)=ln(a^b)=b*ln(a)
dy/y=db*ln(a)+b*(da/a)
dy=y[db*ln(a)+b*(da/a)]
dy=(a^b)[db*ln(a)+b*(da/a)]
dy=ln(a)*(a^b)db+b*$a^{(b-1)}$da
y’=ln(a)*(a^b)b’+b*$a^{(b-1)}$a’
Exponential & Power Rule

y=x^b (Special case: b=constant)
y’=ln(x)*(x^b)b’+b*$x^{(b-1)}$x’]
y’=ln(x)*(x^b)(0)+b*$x^{(b-1)}$x’]
y’=b*$x^{(b-1)}$x’
Power Rule

y=a^x (Special case: a=constant)
y’=ln(a)*(a^x)x’+x*$a^{(x-1)}$a’]
y’=ln(a)*(a^x)x’+x*$a^{(x-1)}$(0)]
y’=ln(a)*(a^x)x’
Exponential Rule

y=x^x (Special case: a=b=x)
dy=ln(x)*(x^x)dx+x*$x^{(x-1)}$dx]
dy=ln(x)*(x^x)dx+x^xdx]
dy=[ln(x)+1]*(x^x)dx
y’=[ln(x)+1]*(x^x)x’
Hyper-Exponent Rule

y=x^1=x (Special case: b='1')
y’=ln(x)*(x^b)b’+b*$x^{(b-1)}$x’]
y’=ln(x)*(x^1)(0)+1*$x^{(1-1)}$x’]
y’=1x’
Linear Rule

y=e^x (Special case: a='e')
y’=ln(e)*(e^x)x’
y’=(e^x)x’
Natural Exponent (e) Rule

y=f(g[x])
dy=df
(dy/dx)=(df/dx)
(dy/dx)=(df/dx)(dg/dg)
(dy/dx)=(df/dg)(dg/dx)
y’=(df/dg)g’
Chain Rule (2 links)

y=f(g[h{x}])
dy=df
(dy/dx)=(df/dx)
(dy/dx)=(df/dx)(dg/dg)(dh/dh)
(dy/dx)=(df/dg)(dg/dh)(dh/dx)
y’=(df/dg)(dg/dh)h’
Chain Rule (3 links)

y=f(g[h{...(z(x)…}])
dy=df
(dy/dx)=(df/dx)
(dy/dx)=(df/dx)(dg/dg)(dh/dh)...(dz/dz)
(dy/dx)=(df/dg)(dg/dh)...(dz/dx)
y’=(df/dg)(dg/dh)...z’
Chain Rule (n links)

y=sin(x)=(e^{ix}-e^{-ix})/(2i)
y’=[(i)e^{ix}-(-i)e^{-ix}]x’/(2i)
y’=[ie^{ix}+ie^{-ix}]x’/(2i)
y’=(i)[e^{ix}+e^{-ix}]x’/(2i)
y’=(e^{ix}+e^{-ix})x’/(2)=cos(x)x’
Sine Rule

y=cos(x)=(e^{ix}+e^{-ix})/(2)
y’=[(i)e^{ix}+(-i)e^{-ix}]x’/(2)
y’=(i)[e^{ix}-e^{-ix}]x’/(2)
y’=(i^2)[e^{ix}+e^{-ix}]x’/(2i)
y’=-(e^{ix}+e^{-ix})x’/(2)=-sin(x)x’
Cosine Rule

y=tan(x)=sin(x)/cos(x)
y’=UseQuotientRule
y’=[cos(x)cos(x)-sin(x)(-sin(x))]/$\cos^2$(x)
y’=[cos(x)cos(x)+sin(x)(sin(x))]/$\cos^2$(x)
y’=1/$\cos^2$(x)x’ = $\sec^2$(x)x’
Tangent Rule

y=sinh(x)=(e^x-e^{-x})/(2)
y’=[(1)e^x-(-1)e^{-x}]x’/(2)
y’=(e^x+e^{-x})x’/(2)=cosh(x)x’
Hyperbolic Sine Rule

y=cosh(x)=(e^x+e^{-x})/(2)
y’=[(1)e^x+(-1)e^{-x}]x’/(2)
y’=(e^x-e^{-x})x’/(2)=sinh(x)x’
Hyperbolic Cosine Rule

y=tanh(x)=sinh(x)/cosh(x)
y’=UseQuotientRule
y’=[cosh(x)cosh(x)-sinh(x)(sinh(x)]/$\cosh^2$(x)
y’=1/$\cosh^2$(x)x’ = sech^2(x)x’
Hyperbolic Tangent Rule