1. Rewriting Techniques

    a) Negative exponents
    b) Fractional exponents
    c) Foil
    d) Distributive property
    e) Divide & conquer
    f) Factor & cancel
    g) Trig identities

2. Power Rule

If $f(x) = ax^n$, then $f'(x) = a \cdot nx^{n-1}$.

3. Product Rule

(Two Factors)

If $y = u \cdot v$, then $u'v + v'u$.

$$\frac{d}{dx}(f(x) \bullet g(x)) = f'(x)g(x) + g'(x)f(x)$$

(Three Factors)

If $y = u \cdot v \cdot w$, then $y' = u'vw + uv'w + uvw'$.

4. Quotient Rule

If $y = \dfrac{u}{v}$, then $y' = \dfrac{u'v - v'u}{v^2}$.

$$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{f'(x)g(x) - g'(x)f(x)}{[g(x)]^2}$$

5. Trig Derivatives

a) $\dfrac{d}{dx}(\sin x) = \cos x$

b) $\dfrac{d}{dx}(\cos x) = -\sin x$

c) $\dfrac{d}{dx}(\tan x) = \sec^2 x$

d) $\dfrac{d}{dx}(\cot x) = -\csc^2 x$

e) $\dfrac{d}{dx}(\sec x) = \sec x \tan x$

f) $\dfrac{d}{dx}(\csc x) = -\csc x \cot x$

6. Chain Rule

If $h(x) = f(g(x))$, then $h'(x) = f'(g(x)) \cdot g'(x)$.