

134 FORMULA SHEET

$$1. f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

$$2. \frac{d}{dx} (x^n) = n \cdot x^{n-1}$$

$$3. (f \cdot g)' = f' \cdot g + f \cdot g'$$

$$4. \left(\frac{f}{g}\right)' = \frac{g \cdot f' - f \cdot g'}{g^2}$$

$$5. \frac{d}{dx} (e^x) = e^x$$

$$6. \frac{d}{dx} (\ln(x)) = \frac{1}{x}$$

$$7. (f(g(x)))' = [f'(g(x))] g'(x)$$

$$8. \bar{C}(x) = \frac{C(x)}{x}$$

See other side for integral formulas.

9. $\int (x^n) dx = \frac{1}{n+1}x^{n+1} + C$ when $n \neq -1$

10. $\int (e^x) dx = e^x + C$

11. $\int \left(\frac{1}{x}\right) dx = \ln|x| + C$

12. $\text{Ave}_{[a,b]}(f) = \frac{1}{b-a} \left(\int_a^b f(x) dx \right)$

13. $CS = \left(\int_0^{\bar{x}} D(x) dx \right) - (\bar{x}\bar{p})$

14. $PS = (\bar{x}\bar{p}) - \left(\int_0^{\bar{x}} S(x) dx \right)$

15. Area under $f(x)$ with interval $[a, b]$ $\int_a^b f(x) dx$

16. Area under $f(x)$ without $[a, b]$, solve $f(x) = 0$ to find $[a, b]$.

17. Area between $f(x), g(x)$, in interval $[a, b]$ ($f(x) \geq g(x)$ in interval) $\int_a^b [f(x) - g(x)] dx$

18. Area between $f(x), g(x)$, ($f(x) \geq g(x)$) without $[a, b]$, solve $f(x) = g(x)$ to find $[a, b]$.