Differentiation - Power rule:

F'(x) = f'(g(x))g'(x)

Integration - Power rule:

$$\int f'(x) [f(x)]^n dx = \frac{1}{n+1} [f(x)]^{n+1} + c \quad n \neq -1$$

Tips:

- 1. The Reverse chain rule is used to integrate composite functions
- 2. You can check your answer by expanding the function (if possible) first
- 3. The constant of a function can be moved outside the integral

Constant Multiple:

$$\int_{a}^{b} kf(x)dx = k \int_{a}^{b} f(x)dx \quad \text{Any number } k$$
$$\int_{a}^{b} -f(x)dx = -\int_{a}^{b} f(x)dx \quad k = -1$$

- 4. Change roots/fractions to index power before integrating $3/x^3 = 3x^{-3}$
- 5. Simplify fractions by dividing numerator by denominator $(x^3 + x^2)/x = x^2 + x$
- 6. When there are brackets, you can expand! $x(2x-9) = 2x^2 - 9$

6.1 WORKED EXAMPLE	6.2 WORKED EXAMPLE
$\int (ax+b)^n dx$	$\int (2x+1)^2 dx$