

Section 5.4 part F: Indefinite versus definite integrals

1. An indefinite integral is a *function*. For example,

$$\int 2x \, dx = x^2 + c$$

2. A definite integral is a *number*. For example,

$$\int_1^2 2x \, dx = x^2 \Big|_1^2 = 4 - 1 = 3$$

3. As you can see, they have the same antiderivative, x^2 , except for the $+c$.
4. Why don't we use the $+c$ in the definite integral?
5. If we did, this is what would happen:

$$\int_1^2 2x \, dx = (x^2 + c) \Big|_1^2 = (4 + c) - (1 + c) = 3$$

If we used the $+c$ here, it would always cancel, so we don't bother writing it.