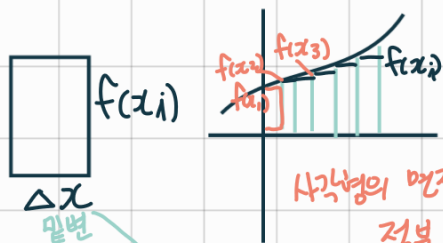


$$\sum_{i=1}^3 i^2 \equiv 1^2 + 2^2 + 3^2$$

시그마 = 더한다는 것 (반복을 생각해보자)
 1이 더한 (1²) 하나씩 더한다.

$$\textcircled{1} 2^2 + 3^2 + 4^2 + 5^2 \quad \sum_{i=2}^5 i^2$$

$$\textcircled{2} 3^3 + 4^3 + 5^3 + 6^3 \quad \sum_{i=3}^6 i^3$$



사각형의 개수 다 더하면...
 적분?

Δx를 0으로 보낼

적분
 $\lim_{\Delta x \rightarrow 0} \sum f(x) \Delta x$
 높이

$\lim_{\Delta x \rightarrow 0} \sum f(x) \Delta x = \int f(x) dx$
 integral
 미적분 (적분)
 연속의 합

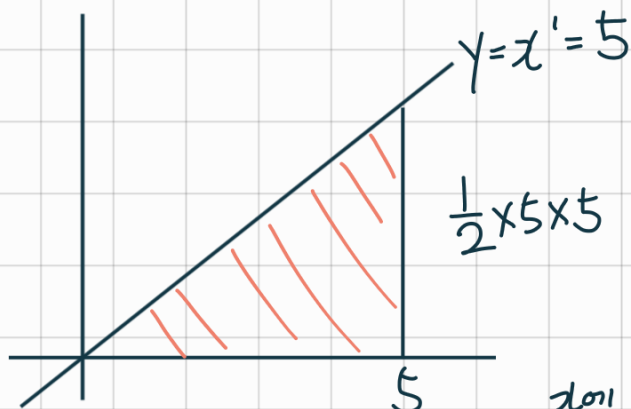
$$\int x^n dx = \frac{x^{n+1}}{n+1}$$

미분하면

미분을 해와

$$\left(\frac{x^{n+1}}{n+1} \right)' = \frac{1}{n+1} (x^{n+1})'$$

$5x \quad \cancel{\frac{1}{n+1}} \quad \cancel{n+1} x^{n+1-1}$

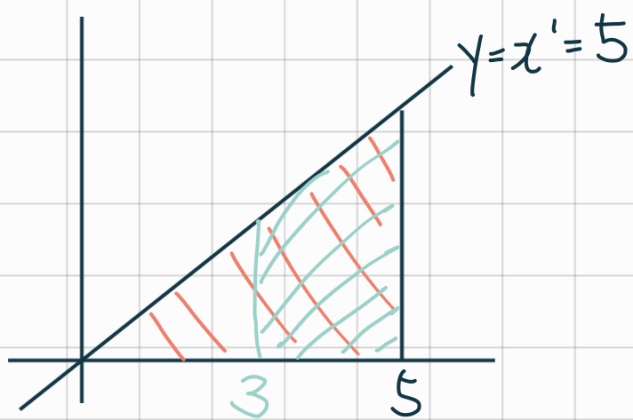


x를 5대입

$$\int_0^5 x dx = \left[\frac{x^2}{2} \right]_0^5 = \frac{5^2}{2} - \frac{0^2}{2} = \frac{5^2}{2}$$

적분하면

$$x = \frac{x^2}{2}$$



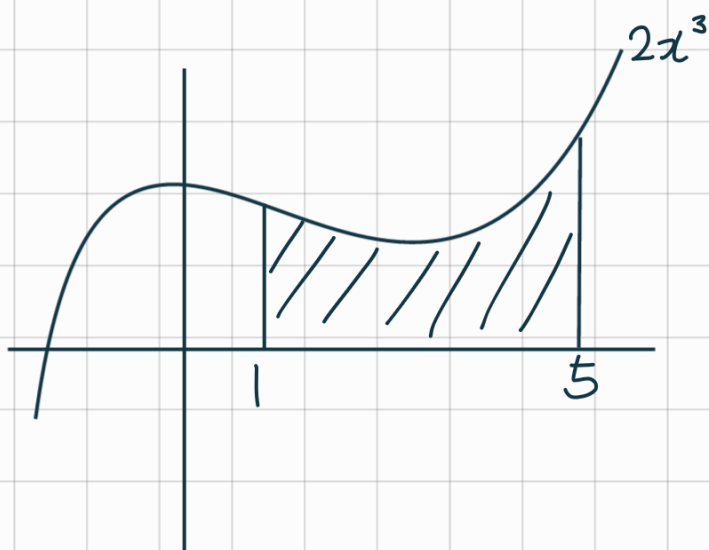
사다리꼴 면적은?

$$\frac{1}{2} \times 5^2 - \frac{1}{2} \times \frac{2}{3}$$

$$\frac{1}{2} (5^2 - 9) = 8$$

한번 더 보자 ↓

$$\int_3^5 x dx = \frac{5^2}{2} - \frac{3^2}{2} = \frac{25-9}{2} = \frac{16}{2} = 8$$



$$2 \int x^3 dx$$

$$2 \left[\frac{x^4}{4} \right]_1^5 = 2 \left(\frac{5^4}{4} - \frac{1^4}{4} \right)$$

$$\int x^n dx = \frac{x^{n+1}}{n+1}$$

↑ 미분 역

$$\int_2^4 (2x^3 - 4x^2 + 5x + 7) dx$$

$$\int x^n dx = \frac{x^{n+1}}{n+1}$$

↑
이름하면

$$= 2 \int_2^4 x^3 - 4 \int x^2 + 5 \int x + \int 7$$

$$= 2 \left[\frac{x^4}{4} \right]_2^4 - 4 \left[\frac{x^3}{3} \right]_2^4 + 5 \left[\frac{x^2}{2} \right]_2^4 + \left[7x \right]_2^4$$

$$= 2 \left(\frac{2^4 - 2^4}{4} \right) - 4 \frac{1}{3} (4^3 - 2^3) + 5 \frac{1}{2} (4^2 - 2^2) + 7 \times 2$$

$$= 2^4 (2^4 - 1) - \frac{4}{3} (2^3 (2^3 - 1)) + \frac{5}{2} (16 - 4) + 14$$

$$\sin x' \rightarrow \cos x$$

$$(\cos x)' \rightarrow -\sin x$$

$$(e^x)' \rightarrow e^x$$

$$\int \sin x dx$$

$$= -\cos x$$

$$\int \cos x dx$$

$$= \sin x$$

$$\int e^x dx = e^x$$

$$\int_{\frac{\pi}{2}}^{\pi} \cos \phi d\phi = ?$$

$$[\sin \phi]_{\frac{\pi}{2}}^{\pi}$$

$$= \sin \pi - \left(\sin \left(-\frac{\pi}{2} \right) \right)$$

$$0 - (-1) = 1$$

