Finding Solutions to Definite Integrals

① $A = \int_a^b f(x)\,dx$ find the general solution for $\int f(x)\,dx$

- forget about "c"
- $F(x) = \int f(x)\,dx$

② $\int_a^b f(x)\,dx = F(b) - F(a) = F\Big|_a^b$

- Substitute b into $F(x) \longrightarrow F(b)$
- Substitute a into $F(x) \longrightarrow F(a)$
- Take the difference: $F(b) - F(a)$

Integral Properties

$$\int c\, f(x)\,dx = c\int f(x)\,dx$$

$$\int [f(x)+g(x)]\,dx = \int f(x)\,dx + \int g(x)\,dx$$

Integral Identities

$$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C \qquad n \neq -1$$

$$\int \frac{1}{x}\,dx = \ln|x| + c$$

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

$$\int \sin(x)\,dx = -\cos(x) + c$$

$$\int \cos(x)\,dx = \sin(x) + c$$

1. $\int_0^7 3x^2\,dx$

2. $\int_0^2 \left(6x^5 - 19x^3 + 7\sqrt{2x} - 4\right)dx$

3. $\int_0^{2\pi} 12\cos(t)\,dt$

4. $\int_1^2 \left(14e^b + \frac{8}{b}\right) db$

5 $\int_{3}^{7}\left[4g^{3}-2g+\frac{3}{2}\sin(g)\right]dg$

6 $\int_{.5}^{.7}\left[\sin^{2}(u)+\cos^{2}(u)\right]du$