

配方法查表積分練習題

試求下列各項不定積分.

$$1. \int \frac{1}{x^2 + 6x - 8} dx$$

$$\text{解. } \frac{1}{2\sqrt{17}} \ln \left| \frac{x+3-\sqrt{17}}{x+3+\sqrt{17}} \right| + C$$

$$2. \int \frac{1}{x^2 + 4x - 5} dx$$

$$\text{解. } \frac{1}{6} \ln \left| \frac{x-1}{x+5} \right| + C$$

$$3. \int \frac{1}{(x-1)\sqrt{x^2 - 2x + 2}} dx$$

$$\text{解. } -\ln \left| \frac{1+\sqrt{x^2-2x+2}}{x-1} \right| + C$$

$$4. \int \sqrt{x^2 - 6x} dx \quad \text{解. } \frac{1}{2} \left[(x-3)\sqrt{x^2 - 6x} \right.$$

$$\left. -9 \ln \left| x - 3 + \sqrt{x^2 - 6x} \right| \right] + C$$

$$5. \int \frac{1}{2x^2 - 4x - 6} dx$$

$$\text{解. } \frac{1}{8} \ln \left| \frac{x-3}{x+1} \right| + C$$

$$6. \int \frac{\sqrt{7 - 6x - x^2}}{x + 3} dx$$

$$\text{解. } \sqrt{7 - 6x - x^2} - 4 \ln \left| \frac{4 + \sqrt{7 - 6x - x^2}}{x + 3} \right| + C$$

$$7. \int \frac{x}{\sqrt{x^4 + 2x^2 + 2}} dx$$

$$\text{解. } \frac{1}{2} \ln \left| x^2 + 1 + \sqrt{x^4 + 2x^2 + 2} \right| + C$$

$$8. \int \frac{x\sqrt{x^4 + 4x^2 + 5}}{x^2 + 2} dx$$

$$\text{解. } \frac{1}{2} \left(\sqrt{x^4 + 4x^2 + 5} - \ln \left| \frac{1 + \sqrt{x^4 + 4x^2 + 5}}{x^2 + 2} \right| \right) + C$$