

Indefinite Integrals III - Answer Key

Compute the following indefinite integrals.

$$1. \int \frac{dx}{x^2 - 5x - 6} \\ \ln \left| \frac{x-3}{x-2} \right| + C$$

$$6. \int \frac{dx}{x^4 - 16} \\ \frac{1}{32} \left| \frac{x-2}{x+2} \right| - \frac{1}{16} \tan^{-1} \left(\frac{x}{2} \right) + C$$

$$2. \int \frac{2x+3}{x^2-x-12} dx \\ \ln |x^2-x-12| + \frac{4}{7} \ln \left| \frac{x-4}{x+3} \right| + C$$

$$7. \int x^2 \sin(x) dx \\ 2x \sin x + (2-x^2) \cos x + C$$

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

$$8. \int \frac{x}{\sqrt{4-x^2}} dx \\ 6 \sin^{-1} \left(\frac{x}{2} \right) - \frac{x^3}{8} \sqrt{4-x^2} + C$$

$$4. \int \frac{x^2-x-12}{x^2+x-12} dx \\ x - \ln(x^2+x-12) + \frac{1}{7} \ln \left| \frac{x-3}{x+4} \right| + C$$

$$9. \int \frac{\sqrt{a^2+x^2}}{x^2} dx \\ \frac{1}{2} \ln \left| \frac{\sqrt{a^2+x^2}+x}{\sqrt{a^2+x^2}-x} \right| - \frac{\sqrt{x^2+a^2}}{x} + C$$

$$5. \int \sqrt{1+4x^2} dx \\ x \sqrt{1+4x^2} + \frac{1}{2} \ln |2x + \sqrt{1+4x^2}| + C$$

$$10. \int e^x \sqrt{4-e^{2x}} dx \\ 2 \sin^{-1} \left(\frac{e^x}{2} \right) + \frac{e^x}{4} \sqrt{4-e^{2x}} + C$$

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