

$$\begin{aligned}\int \frac{1}{(x+2)(x+3)} dx &= \frac{1}{3-2} \ln \left| \frac{x+2}{x+3} \right| + C_2 \\ &= \ln \left| \frac{x+2}{x+3} \right| + C_2 \\ &= \ln|x+2| - \ln|x+3| + C_2\end{aligned}$$

Now combining the parts gives the result.

$$\begin{aligned}\int \frac{x+1}{x^2+5x+6} dx &= 3\ln|x+3| - 2\ln|x+2| + C_1 + \ln|x+2| - \ln|x+3| + C_2 \\ &= 2\ln|x+3| - \ln|x+2| + C \quad \text{Where } C = C_1 + C_2\end{aligned}$$

15.3 EXERCISES

PRACTICE

Use Table 1 to find the following integrals.

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|---------------------------------------|---------------------------------------|--------------------------------------|
| 1. $\int \frac{1}{4x+3} dx$ | 2. $\int \sqrt{9x+2} dx$ | 3. $\int e^{-0.15x} dx$ |
| 4. $\int \ln x dx$ | 5. $\int \frac{1}{(2x-5)^2} dx$ | 6. $\int \frac{x}{x+6} dx$ |
| 7. $\int x\sqrt{3x-4} dx$ | 8. $\int \frac{x}{(2x+1)(x-2)} dx$ | 9. $\int \sqrt{x^2+36} dx$ |
| 10. $\int x^4 \ln x dx$ | 11. $\int \frac{1}{x^2-16} dx$ | 12. $\int \frac{1}{x(4x-3)} dx$ |
| 13. $\int \frac{1}{(x+8)(5x-1)} dx$ | 14. $\int \frac{1}{2+e^{3x}} dx$ | 15. $\int 7x^5 \ln x dx$ |
| 16. $\int x^4 e^{-2x} dx$ | 17. $\int \frac{1}{8-5e^{-0.7x}} dx$ | 18. $\int \frac{1}{(0.3x+2)^2} dx$ |
| 19. $\int \frac{2}{x(3x-1)} dx$ | 20. $\int \frac{4}{x^2-8} dx$ | 21. $\int 14\sqrt{6x-5} dx$ |
| 22. $\int \frac{13}{(4x-1)(2x+3)} dx$ | 23. $\int \frac{8}{x(0.4x+1)} dx$ | 24. $\int 2x\sqrt{3x-4} dx$ |
| 25. $\int x^3 e^{1.5x} dx$ | 26. $\int \sqrt{x^2+9} dx$ | 27. $\int \frac{x}{(x-7)(5x+2)} dx$ |
| 28. $\int \sqrt{x^2-15} dx$ | 29. $\int \frac{1}{\sqrt{x^2-12}} dx$ | 30. $\int \frac{6}{24-9e^{3.1x}} dx$ |