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

Now combining the parts gives the result.

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

7.3 EXERCISES

PRACTICE

Use Table 1 to find the following integrals.

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. $\int \frac{6}{24-9e^{3.1x}}dx$