

(Fall 05) Section 6.1 p. 406 1-37 (ODD), 39, 41, 45, 47

$$\begin{aligned} \textcircled{1} \int x^{99} dx &= \frac{x^{99+1}}{99+1} + C \\ &= \frac{x^{100}}{100} + C \end{aligned}$$

$$\begin{aligned} \textcircled{3} \int x^{-99} dx &= \frac{x^{-99+1}}{-99+1} + C \\ &= \frac{x^{-98}}{-98} + C \end{aligned}$$

$$\begin{aligned} \textcircled{5} \int 5 dx &\rightarrow 5 \left(\frac{x^{0+1}}{0+1} \right) + C \\ &= 5 \int (1) dx = 5x + C \\ &= 5 \int x^0 dx \end{aligned}$$

$$\begin{aligned} \textcircled{7} \int 5y^{-3} dy &= 5 \frac{y^{-3+1}}{-3+1} + C \\ &= \frac{-5}{2} y^{-2} + C \end{aligned}$$

$$\begin{aligned} \textcircled{9} \int 2y^{-5} dy &= 2 \left[\frac{y^{-5+1}}{-5+1} \right] + C \\ &= 2 \left[\frac{y^{-4}}{-4} \right] + C \\ &= \frac{y^{-4}}{-2} + C = -\frac{1}{2y^4} + C \end{aligned}$$

$$\begin{aligned} \textcircled{11} \int u^{2/3} du &= \frac{u^{2/3+1}}{2/3+1} + C \\ &= \frac{u^{5/3}}{5/3} + C \\ &= \frac{3u^{5/3}}{5} + C \end{aligned}$$

$$\begin{aligned} \textcircled{13} \int (6x^2 + 4x) dx &= \frac{6x^3}{3} + \frac{4x^2}{2} + C \\ &= 2x^3 + 2x^2 + C \end{aligned}$$

$$\begin{aligned} \textcircled{15} \int (x^2 + x + 1) dx &= \frac{x^3}{3} + \frac{x^2}{2} + x + C \end{aligned}$$

$$\begin{aligned} \textcircled{17} \int (\sqrt{2}u^{0.1} - 0.1u^{1.1}) du &= \frac{\sqrt{2}u^{1.1}}{1.1} - \frac{0.1u^{2.1}}{2.1} + C \end{aligned}$$

$$\begin{aligned} \textcircled{19} \int (t^2 - 1) dt &= \frac{t^3}{3} - t + C \\ \textcircled{21} \int (t^{1/2} - t^{5/3}) dt &= \frac{t^{3/2}}{3/2} - \frac{t^{8/3}}{8/3} + C \\ &= \frac{2t^{3/2}}{3} - \frac{3t^{8/3}}{8} + C \end{aligned}$$

$$\begin{aligned} \textcircled{23} \int (6t^5 - 4t^3 + 1) dt &= \frac{6t^6}{6} - \frac{4t^4}{4} + t + C \\ &= t^6 - t^4 + t + C \end{aligned}$$

$$\begin{aligned} \textcircled{25} \int (1 + 3x^{-1}) dx &= x + 3 \ln x + C \\ &= x + \ln x^3 + C \end{aligned}$$

$$\textcircled{27} \int (\pi + \frac{1}{x}) dx = \pi x + \ln x + C$$

$$\begin{aligned} \textcircled{29} \int \frac{t+1}{t^{1/2}} dt &= \int (t^{1/2} + t^{-1/2}) dt \\ &= \frac{t^{3/2}}{3/2} + \frac{t^{1/2}}{1/2} + C \\ &= \frac{2t^{3/2}}{3} + 2t^{1/2} + C \end{aligned}$$

$$\begin{aligned} \textcircled{31} \int (e^x - 3x) dx &= e^x - \frac{3x^2}{2} + C \end{aligned}$$

$$\begin{aligned} \textcircled{33} \int 5e^x dx &= 5e^x + C \end{aligned}$$

$$\begin{aligned} \textcircled{35} \int (5e^x - 4) dx &= 5e^x - 4x + C \end{aligned}$$

$$\begin{aligned} \textcircled{37} \int (1 + \frac{1}{x}) dx &= x + \ln x + C \end{aligned}$$

$$\begin{aligned} \textcircled{39} R(x) &= \int R'(x) dx \\ &= \int (30 - 0.5x) dx \\ &= 30x - \frac{0.5x^2}{2} + C \\ &= 30x - 0.25x^2 + C \\ &= 30x - \frac{x^2}{4} + C \\ &= 30x - \frac{1}{4}x^2 + C \end{aligned}$$

$$\begin{aligned} \textcircled{41} p(x) &= \int p'(x) dx \\ p(x) &= \int -x^{-3/2} dx \\ &= \frac{-x^{-1/2}}{-1/2} + C = \frac{2}{\sqrt{x}} + C \\ p(1) &= \frac{2}{\sqrt{1}} + C = 3 \\ 2 + C &= 3, C = 1 \\ p(x) &= \frac{2}{\sqrt{x}} + 1 \end{aligned}$$

$$\begin{aligned} \textcircled{43} C(x) &= \int (30x^{1/2} - 6x^3) dx \\ C(x) &= \frac{30x^{3/2}}{3/2} - \frac{6x^4}{4} \\ C(x) &= 20x^{3/2} - 1.5x^4 \end{aligned}$$

$$\begin{aligned} \textcircled{45} \text{ Note } v(t) &= s'(t) \\ s(t) &= \int (-32t + 30) dt \\ s(t) &= \frac{-32t^2}{2} + 30t + C \\ &= -16t^2 + 30t + C \end{aligned}$$