

$$\textcircled{3} \int 4(2x+3)^4 dx$$

$$u = 2x+3 \\ du = 2dx$$

7.2

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$$= \int 2u^4 du$$

$$= \frac{2u^5}{5} + C = \frac{2}{5}(2x+3)^5 + C$$

$$\textcircled{5} \int \frac{2dm}{(2m+1)^3}$$

$$u = 2m+1 \\ du = 2dm$$

$$= \int \frac{du}{u^3} = \frac{u^{-2}}{-2} + C = \frac{-1}{2(2m+1)^2} + C$$

$$\textcircled{7} \int \frac{2x+2}{(x^2+2x-4)^4} dx$$

$$u = x^2+2x-4 \\ du = (2x+2)dx$$

$$= \int u^{-4} du = \frac{u^{-3}}{-3} + C = \frac{-1}{3(x^2+2x-4)^3} + C$$

$$\textcircled{9} \int z \sqrt{4z^2-5} dz$$

$$u = 4z^2-5 \\ du = 8z dz$$

$$= \frac{1}{8} \int \sqrt{u} du = \frac{u^{3/2}}{12} + C = \frac{(4z^2-5)^{3/2}}{12} + C$$

$$\textcircled{11} \int 3x^2 e^{2x^3} dx$$

$$u = 2x^3 \\ du = 6x^2 dx$$

$$= \frac{1}{2} \int e^u du = \frac{e^u}{2} + C = \frac{e^{2x^3}}{2} + C$$

$$\textcircled{13} \int (1-t) e^{2t-t^2} dt \quad u = 2t-t^2 \quad du = (2-2t)dt = 2(1-t)dt$$

$$= \frac{1}{2} \int e^u du = \frac{e^u}{2} + C = \frac{e^{2t-t^2}}{2} + C$$

$$\textcircled{15} \int \frac{e^{1/2}}{z^2} dz \quad u = \frac{1}{z} \quad du = -\frac{1}{z^2} dz$$

$$= - \int e^u du = -e^u + C = -e^{1/z} + C$$

$$\textcircled{17} \int \frac{t}{t^2+2} dt \quad u = t^2+2 \quad du = 2t dt$$

$$= \frac{1}{2} \int \frac{1}{u} du = \frac{1}{2} \ln|u| + C = \frac{1}{2} \ln(t^2+2) + C$$

$$\textcircled{19} \int \frac{x^3+2x}{x^4+4x^2+7} dx \quad u = x^4+4x^2+7 \quad du = (4x^3+8x)dx = 4(x^3+2x)dx$$

$$= \frac{1}{4} \int \frac{1}{u} du = \frac{1}{4} \ln|u| + C = \frac{1}{4} \ln(x^4+4x^2+7) + C$$

$$\textcircled{21} \int \frac{2x+1}{(x^2+x)^3} dx \quad u = x^2+x \quad du = 2x+1$$

$$= \int u^{-3} du = \frac{u^{-2}}{-2} + C = \frac{-1}{x^2(x+1)^2} + C$$

$$\textcircled{23} \int p(p+1)^5 dp \quad u = p+1, p = u-1$$

$$du = dp$$

$$= \int (u-1) u^5 du = \int (u^6 - u^5) du = \frac{u^7}{7} - \frac{u^6}{6} + C$$

$$= \frac{(p+1)^7}{7} - \frac{(p+1)^6}{6} + C$$

$$\textcircled{25} \int \frac{u}{\sqrt{u-1}} du \quad x = u-1, u = x+1$$

$$dx = du$$

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

$$= \frac{2}{3} (u-1)^{3/2} + 2(u-1)^{1/2} + C$$

$$\textcircled{27} \int \sqrt{x^2+12x} (x+6) dx \quad u = x^2+12x \quad du = (2x+12) dx$$

$$= 2(x+6) dx$$

$$= \frac{1}{2} \int \sqrt{u} du = \frac{1}{3} u^{3/2} + C = \frac{(x^2+12x)^{3/2}}{3} + C$$

$$\textcircled{28} \int \frac{(1+3 \ln x)^2}{x} dx \quad u = 1+3 \ln x, du = \frac{3}{x} dx$$

$$= \int \frac{1}{3} u^2 du = \frac{u^3}{9} + C = \frac{(1+3 \ln x)^3}{9} + C$$

$$\textcircled{3} \int \frac{e^{2x}}{e^{2x}+5} dx \quad u = e^{2x}+5 \quad du = 2e^{2x} dx$$

$$= \int \frac{1}{2} \cdot \frac{1}{u} du = \frac{1}{2} \ln|u| + C = \frac{1}{2} \ln(e^{2x}+5) + C$$