Solution
Derivative Rules Backwards

857. $\int (x^3+2)\,dx = \boxed{\frac{x^4}{4} + 2x + C}$

858. $\int (x^2 - 2x + 3)\,dx = \frac{x^3}{3} - \frac{2x^2}{2} + 3x + C$

$= \boxed{\frac{x^3}{3} - x^2 + 3x + C}$

859. $\int (x^{\frac{3}{2}} + 2x + 1)\,dx = \frac{x^{\frac{5}{2}}}{\frac{5}{2}} + \frac{2x^2}{2} + x + C$

$= \boxed{\frac{2}{5}x^{\frac{5}{2}} + x^2 + x + C}$

860. $\int \left(\sqrt{x} + \frac{1}{2\sqrt{x}}\right)dx$ REWRITE $\int \left(x^{\frac{1}{2}} + \frac{1}{2}x^{-\frac{1}{2}}\right)dx$

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

$\frac{\frac{1}{2}x^{\frac{1}{2}}}{\frac{1}{2}} = \frac{1}{2}x^{\frac{1}{2}}\left(\frac{2}{1}\right)$

$\boxed{= \frac{2}{3}x^{\frac{3}{2}} + x^{\frac{1}{2}} + C}$

861. $\int \sqrt[3]{x^2}\,dx$ REWRITE $\int x^{\frac{2}{3}}\,dx = \boxed{\frac{x^{\frac{5}{3}}}{\frac{5}{3}} = \frac{3}{5}x^{\frac{5}{3}} + C}$

862. $\int \frac{1}{x^3}\,dx = \int x^{-3}\,dx = \frac{x^{-2}}{-2} + C = \boxed{-\frac{1}{2}x^{-2} + C}$

863. $\int \frac{x^2+1}{x^2}\,dx$ REWRITE $\int (1 + x^{-2})\,dx = x + \frac{x^{-1}}{-1} + C$

$\frac{x^2}{x^2} + \frac{1}{x^2} = 1 + x^{-2}$

$= \boxed{x - \frac{1}{x} + C}$

SOLUTIONS (CONT.)

864. $\int x^2\sqrt{x}\,dx = \int x^2 x^{\frac{1}{2}}\,dx = \int x^{\frac{5}{2}}\,dx =$

$\frac{x^{\frac{7}{2}}}{\frac{7}{2}}\,dx = \boxed{\frac{2}{7}x^{\frac{7}{2}} + C}$

865. $\int 3\,dx = \boxed{3x + C}$

866. $\int (x^2 - \sin x)\,dx = \boxed{\frac{x^3}{3} + \cos x + C}$

867. $\int (1 - \csc x \cot x)\,dx = \boxed{x + \csc x + C}$

868. $\int (\sec^2\theta - \sin\theta)\,d\theta = \boxed{\tan\theta + \cos\theta + C}$

869. $\int \sec\theta(\tan\theta - \sec\theta)\,d\theta$ REWRITE $\int (\sec\theta\tan\theta - \sec^2\theta)\,d\theta$

$\int (\sec\theta\tan\theta - \sec^2\theta)\,d\theta = \boxed{\sec\theta - \tan\theta + C}$

870. $\int \frac{8}{x^{\frac{3}{5}}}\,dx = \int 8x^{-\frac{3}{5}}\,dx = \frac{8x^{\frac{2}{5}}}{\frac{2}{5}} = 8\left(\frac{5}{2}\right)x^{\frac{2}{5}} = \boxed{20x^{\frac{2}{5}} + C}$

871. $\int \frac{-3x}{\sqrt[3]{x^4}}\,dx = \int \frac{-3x}{x^{\frac{4}{3}}}\,dx = \int -3x\,x^{-\frac{4}{3}}\,dx = \int -3x^{-\frac{1}{3}}\,dx = \frac{-3x^{\frac{2}{3}}}{\frac{2}{3}} + C$

$x^{\frac{3}{3}+\frac{-4}{3}}$

$\boxed{= -\frac{9}{2}x^{\frac{2}{3}} + C}$

872. $\int 7x^3(3x^4-2x)\,dx = \int (21x^7 - 14x^4)\,dx = \boxed{\frac{21x^8}{8} - \frac{14x^5}{5} + C}$

873. $\int \frac{7\sqrt{x} - 3x^2 - 3}{4\sqrt{x}}\,dx = \int \left(\frac{7x^{\frac{1}{2}}}{4x^{\frac{1}{2}}} - \frac{3x^2}{4x^{\frac{1}{2}}} - \frac{3}{4x^{\frac{1}{2}}}\right)dx$

$= \int \left(\frac{7}{4} - \frac{3}{4}x^{\frac{3}{2}} - \frac{3}{4}x^{-\frac{1}{2}}\right)dx$

$= \frac{7}{4}x - \frac{3}{4}x^{\frac{5}{2}}\frac{2}{5} - \frac{3}{4}x^{\frac{1}{2}}(2) + C$

$\boxed{= \frac{7}{4}x - \frac{3}{10}x^{\frac{5}{2}} - \frac{3}{2}x^{\frac{1}{2}} + C}$

874. $\int e^x\,dx = \boxed{e^x + C}$

Remember
$\frac{d}{dx}\left[e^x + C\right] = e^x$

876. $\int 5e^x\,dx = \boxed{5e^x + C}$

877. $\int \frac{1}{x^2+1}\,dx = \boxed{\arctan x + C}$

Remember
$\frac{d}{dx}\left[\arctan u\right] = \frac{u'}{1+u^2}$

878. $\int \frac{3}{\sqrt{1-x^2}}\,dx = \boxed{3\arcsin x + C}$