7. $\int \left[x^3 - \frac{1}{(5x)^3}\right] dx$

$= \int \left[x^3 - \frac{1}{125x^3}\right] dx$

$= \int \left[x^3 - \frac{1}{125}x^{-3}\right] dx$

$= \frac{x^{3+1}}{3+1} - \frac{1}{125} \cdot \frac{x^{-3+1}}{-3+1} + C$

$= \frac{1}{4}x^4 - \frac{1}{125} \cdot \frac{x^{-2}}{-2} + C$

$= \boxed{\frac{1}{4}x^4 + \frac{1}{250x^2} + C}$

8. $\int \frac{x - 3x^3}{\sqrt[3]{x}} dx$

$= \int \left(\frac{x}{\sqrt[3]{x}} - \frac{3x^3}{\sqrt[3]{x}}\right) dx$

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

$= \int \left(x^{\frac{2}{3}} - 3x^{\frac{8}{3}}\right) dx$

$= \frac{x^{\frac{2}{3}+1}}{\frac{2}{3}+1} - 3 \cdot \frac{x^{\frac{8}{3}+1}}{\frac{8}{3}+1} + C$

$= \frac{x^{\frac{5}{3}}}{\frac{5}{3}} - 3\,\frac{x^{\frac{11}{3}}}{\frac{11}{3}} + C$

$= \frac{3}{5}x^{\frac{5}{3}} - 3 \cdot \frac{3}{11}x^{\frac{11}{3}} + C$

$= \boxed{\frac{3}{5}x^{\frac{5}{3}} - \frac{9}{11}x^{\frac{11}{3}} + C}$

9. $\frac{dy}{dx} = \frac{x+2}{\sqrt{x^2+4x+5}}$

$y = \int \frac{dy}{dx}$

$= \int \frac{x+2}{(x^2+4x+5)^{\frac{1}{2}}} dx$

$u = x^2+4x+5 \quad du = 2x+4\,dx$

$du = 2(x+2)\,dx$

$= \frac{1}{2}\int \frac{2(x+2)}{(x^2+4x+5)^{1/2}} dx$

$= \frac{1}{2}\int \frac{1}{u^{\frac{1}{2}}} du$

$= \frac{1}{2}\int u^{-\frac{1}{2}} du$

$= \frac{1}{2} \cdot \frac{u^{-\frac{1}{2}+1}}{-\frac{1}{2}+1} + C$

$= \frac{1}{2} \cdot \frac{u^{1/2}}{\frac{1}{2}} + C$

$= u^{1/2} + C$

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