10) $\int \dfrac{3}{t}\,dt = \int 3t^{-5}\,dx$

$= 3\left(\dfrac{t^{-5+1}}{-5+1}\right) + C$

$= 3\left(\dfrac{t^{-4}}{-4}\right) + C$

$= -\dfrac{3t^{-4}}{4} + C$

$= -\dfrac{3}{4t^4} + C$

• $f(x) = -\dfrac{3}{4t^4} + C$

$= -\dfrac{3t^{-4}}{4} + C$

$= \dfrac{d}{dx}\, -\dfrac{3t^{-4}}{4} + \dfrac{d}{dx}\, C$

$= \dfrac{3\cdot 4t^{-5}}{4} + 0$

$= 3t^{-5} = \dfrac{3}{t^5}$

11) $\int 5u^{3/2}\,du = 5\int u^{3/2}\,du$

$= 5\left(\dfrac{u^{3/2+1}}{3/2+1}\right) + C$

$= 5\left(\dfrac{u^{5/2}}{5/2}\right) + C$

$= \dfrac{5u^{5/2}}{\frac{5}{2}} + C$

$= \dfrac{10u^{5/2}}{5} + C$

$= 2u^{5/2} + C$

$= 2\sqrt{u^5} + C$

• $f(x) = 2\sqrt{u}^5 + C$

$= 2u^{5/2} + C$

$= \dfrac{d}{dx}\, 2u^{5/2} + \dfrac{d}{dx}\, C$

$= \dfrac{10}{2} u^{3/2} + 0$

$= 5u^{3/2}$

12) $\int 10\sqrt[3]{x^2}\,dx = 10\int x^{2/3}\,dx$

$= 10\left(\dfrac{x^{2/3+1}}{2/3+1}\right) + C$

$= 10\left(\dfrac{x^{5/3}}{5/3}\right) + C$

$= \dfrac{10x^{5/3}}{\frac{5}{3}} + C$

$= \dfrac{30x^{5/3}}{5} + C$

$= 6x^{5/3} + C$

• $f(x) = 6x^{5/3} + C$

$= \dfrac{d}{dx}\, 6x^{5/3} + \dfrac{d}{dx}\, C$

$= \dfrac{30}{3} x^{2/3} + 0$

$= 10x^{2/3}$

$= 10\sqrt[3]{x^2}$