Find an antiderivative (Integrate)

1. $f'(x) = 25x^4 + 8(\sqrt[3]{x}) - \frac{9}{x^4} + 3$

$$\int f'(x)\,dx = \int \left(25x^4 + 8x^{\frac{1}{3}} - 9x^{-4} + 3\right) dx$$

$$f(x) = \frac{25x^5}{5} + \frac{8x^{\frac{4}{3}}}{4/3} - \frac{9x^{-3}}{-3} + 3x + C$$

$$f(x) = 5x^5 + \frac{3}{4}(8x^{4/3}) + 3x^{-3} + 3x + C$$

$$= 5x^5 + 6x^{4/3} + \frac{3}{x^3} + 3x + C \quad \#$$

2. $g'(x) = \dfrac{\cos x}{2\sin^2 x}$

$$\int g'(x)\,dx = \int \left[\frac{\cos x}{2\sin x}\left(\frac{1}{\sin x}\right)\right] dx$$

$$g(x) = \int \left(\frac{1}{2}\cot x \csc x\right) dx$$

$$= \frac{1}{2}\int (\csc x \cot x)\,dx$$

$$= \frac{1}{2}(-\csc x + C)$$

$$= \frac{-\csc x}{2} + C \quad \#$$

3. $y' = \dfrac{x^3+10(\sqrt{x})}{x^4}$

$\frac{1}{2} - 4$

$\frac{1}{2} - \frac{8}{2}$

$\dfrac{x^3+10x^{\frac{1}{2}}}{x^4}$

$= x^{-1} + 10x^{-7/2}$

$y = \int (x^{-1} + 10x^{-7/2})\,dx$

$= \ln|x| + \dfrac{10x^{-5/2}}{-5/2} + C$

$= \ln|x| - \dfrac{2}{5}\,10x^{-5/2} + C$

$= \ln|x| - 4x^{-5/2} + C$ ##