If $f'(x) = 2x$, Find $f(x)$.

$$f(x) = x^2 + c$$

Let $f'(x) = \sqrt{x}$, Find $f(x)$.

$= x^{\frac{1}{2}}$ $\quad \frac{2}{3}x^{\frac{3}{2}} + c = f(x)$

Reverse power rule

$$f'(x) = x^n \quad , \quad f(x) = \frac{1}{n+1}x^{n+1} + C$$

6. $\int \underbrace{\left(\sqrt{x^3} + \sqrt[3]{x^2}\right)}_{f'(x)} dx = \int x^{\frac{3}{2}} + x^{\frac{2}{3}} dx$

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

8. $\int (y^3 + 1.8y^2 - 2.4y)\, dy =$

$f'(x) = y^3 + 1.8y^2 - 2.4y$

$f(x) = \frac{1}{4}y^4 + \frac{1}{3}(1.8)y^3 - \frac{1}{2}(2.4)y^2$

$\boxed{\frac{1}{4}y^4 + 0.6y^3 - 1.2y^2 + C}$

10. $\int v(v^2+2)^2\,dv = \frac{v^6}{6} + v^4 + 2v^2 + C$

$(v^2+2)(v^2+2)$

$v(\cancel{v}^4 + 4v^2 + 4)$

$v^5 + 4v^3 + 4v$

$f(x) = \frac{1}{6}v^6 + \frac{1}{4}(4v)^4 + \frac{1}{2}(4v)^2 + C$

$f(x) = \frac{1}{6}v^6 + v^4 + 2v^2 + C$

12. $\int \left(x^2 + 1 + \frac{1}{x^2 + 1} \right) dx$

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

14. $\int (\csc^2 t - 2e^t)\, dt$

$f(x) = -\cot(t) - 2e^t + c$

16. $\int \sec t\,(\sec t + \tan t)\,dt$