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18/ENG02/075
MAT 104 Assignment

3) If $x = 4t^3 - t^2$ and $y = t^4 + 2t^2$. Find dy/dx

From the equation above $\frac{dy}{dx} = \frac{dy}{dt} \cdot \frac{dt}{dx}$

By differentiation $\frac{dy}{dt} = 4t^3 + 4t$, $\frac{dx}{dt} = 12t^2 - 2t$

Recall $\frac{dy}{dx} = \frac{dy}{dt} \cdot \frac{dt}{dx} = 4t^3 + 4t \times \frac{1}{12t^2 - 2t}$

$= \frac{4t^3 + 4t}{12t^2 - 2t} = \frac{4(t^3 + t)}{2(6t^2 - t)} = \frac{2(t^3 + t)}{(6t^2 - t)}$

$\therefore \frac{dy}{dx} = \frac{2(t^3 + t)}{(6t^2 - t)}$