Section: Dr Imran

MTH101 Assignment No 2 (2023)

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Solution 1:

Set f'(t) = 0 and solve for t:

$$f'(t) = 12t^2 - 4t^3 = 0$$

- Factor out common terms:

$$t^2(12 - 4t) = 0$$

- Set each factor equal to zero:

$$t^2 = 0 \Rightarrow t = 0$$

$$12 - 4t = 0 \Rightarrow t = 3$$

t = 0 and t = 3.

Solution 2:

Let

$$u = t^4 + 2.$$

Calculate $\frac{du}{dt}$:

$$\frac{du}{dt} = 4t^3$$

- Rearrange to solve for dt:

$$dt = \frac{du}{4t^3}$$

- Substitute u and dt into the integral:

= $\int(t^3 \times cos(t^4 + 2))dt = \int(cos(u)) \times (\frac{du}{4t^3})$

- Simplify the integral:

= (1/4) * ∫sin(u) du

- Integrate sin(u):

= - ($\frac{1}{4}$) * cos(u) + C

- Substitute u back:

= - ($\frac{1}{4}$) * cos($t^4 + 2$) + C