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TOPIC: Civil Engineering

ASSIGNMENT

1. Define mathematical modelling.

Mathematical modelling is a mathematical representation of a system which involves setting and obtaining its second variable for different values. When a variable is changed from one value to another.

2. Methods of deriving a model.

- Differentiation
- Use of balance law

3. Solution.

$$T(0) = 10^\circ\text{C}$$

$$T(1) = 20^\circ\text{C}$$

$$\text{Actual Temp} = 20^\circ\text{C} = T_0$$

$$\frac{dT}{dt} = k(T - T_0)$$

$$\frac{dT}{(T - T_0)} = k dt$$

$$\text{Integrate both sides}$$

$$\ln(T - T_0) = kt + C$$

$$T - T_0 = e^{kt+C}$$

$$T - T_0 = e^{kt} \cdot e^C$$

$$\ln(T - T_0) = \ln e^C + \ln e^{kt}$$

$$T - T_0 = A e^{kt}$$

$$T - T_0 = A e^{kt}$$

$$T - T_0 = A e^{kt}$$

$$\text{where } T = 10$$

$$10 - 20 = A e^{k \cdot 0}$$

$$10 - 20 = A$$

$$A = 10 - 20$$

$$A = -10$$

$$T - 20 = -10 e^{kt}$$

$$20 - 20 = -10 e^{k \cdot 0}$$

$$20 - 20 = -10 e^{k \cdot 0}$$

$$20 - 20 = -10 e^{k \cdot 0}$$

$$150^\circ\text{C} = 25 - 20$$

$$150^\circ\text{C} = 25 - 20$$

$$150^\circ\text{C} = 5$$

$$C^\circ\text{C} = 6.3333$$

$$5K = 1.36.333$$

$$5K = 1.36.333$$

$$5K = 1.0886$$

$$K = 0.22$$

$$T(1) = 25 - 10$$

1.2 Using microscope

- Pick a box

- Pick a number

- Insert the value

- Insert the value

- Go to

- Click on box

- Insert a step

- Change the series

- Insert a step to

- Under the above

- Pick a box

- Insert = 25 - 10

- Add fill

- Go to insert

- Pick a graph

- Label the graph