

Adintomre William

Petroleum Engineering

161ENG 071003

ENg 282

### Assignment 1

A)  $\frac{\overline{DE}}{2} = \frac{1}{2} \overline{BC}$

For modelling

$$\frac{dy}{dt} = ky$$

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$$\int \frac{dy}{y} = \int k dt$$

$$\ln y = kt + c$$

$$y = e^{kt+c}$$

$$y = e^{kt} \cdot e^c$$

$$y = e^{kt} \cdot y_0$$

$$y = y_0 e^{kt} \quad \text{--- (1)}$$

b)  $y = 20$

$$20 = C e^{k \times 0}$$

$$20 = y_0$$

Substitute Value for  $y_0$  into (1)

$$y = 20 e^{kt}$$

$$40 = 20 e^{k \times 5}$$

$$e^{5k} = \ln 2$$

$$1k = \frac{\ln 2}{5} = 0.1386$$

Population of bacteria for  $1\frac{1}{2}$  days

$$k = \frac{\ln 2}{6} = 0.1386$$

$$y = 20e^{0.1386t}$$

$$y = 20 \times e^{0.1386 \times 36}$$

$$y = 293.6$$

C on Excel document

d

$$y = 20e^{kt}$$

$$y_{10} = 10e^{0.1386t}$$

$$y_{30} = 30e^{0.1386t}$$

$$y_{60} = 50e^{0.1386t}$$