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18/ENG01/011
CHEMICAL ENGINEERING

ENG 282

(1) 1000g
100
10 gallons each of 5#
10 gal/min
0 < t < 7016

1200g
150
50 gallons each of
30 gal/min
0 < t < 4516

$\frac{dy}{dt} = y_{in} - y_{out}$

$y_{in} = 50 \text{ gallons/min} \times (1 + \sin t)\ lb/gal$

$= 50(1 + \sin t)\ lb/min$

$y_{out} = 2.5\%$ of y

$dy/dt \cdot lb/min = 50(1 + \sin t)\ lb/min - 2.5\%$ of $y\ lb/min$

$dy/dt = 50(1 + \sin t) - 0.025y$

$= -0.025y + 50 + 50\sin t$

$= -0.025\left(\frac{-0.025y}{-0.025} + \frac{50(1 + \sin t)}{0.025}\right)$

$= -0.025(y - 2000(1 + \sin t))$

$dy/dt = -0.025(y - 2000(1 + \sin t))$

$\frac{dy}{[y - 2000(1 + \sin t)]} = -0.025dt$ / $\int \frac{dy}{[y - 2000(1 + \sin t)]} = \int -0.025dt$