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| ;Computer Lab 1:1  METHOD RK4  STARTTIME = 0  STOPTIME=12  DT = 0.02  Dose = 1 ; IV Bolus  thalf = 6 ; h  V = 25 ; L  k = LOGN(2)/thalf  CL = k\*V ; L/h  ;Analytical solution  C0 = Dose/V ; Concentration at time=0  C = C0\*EXP(-k\*time) ; One compartment model  ;Differential equation  d/dt(A1) = -k\*A1  init A1 = Dose ;Initialization of A1 = Dose  CP = A1/V |

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| ;Computer lab 1:2  METHOD RK4  STARTTIME = 0  STOPTIME=12  DT = 0.02  Dose = 1 ; IV Bolus  ;thalf = 6 ; h  CL = 20 ; L/h  V1 = 75 ; L  V2 = 100 ; L  Q = 100 ; L/h  k10 = CL/V1  k12 = Q/V1  k21 = Q/V2  ;Differential equation  d/dt(A1) = -k10\*A1 + k21\*A2 - k12\*A1  d/dt(A2) = k12\*A1 - k21\*A2  C1 = A1/V1  C2 = A2/V2  init A1 = Dose ;Initialization of A1 = C0  init A2 = 0 ;Initialization of A2 = 0 |

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| ;Computer lab 1:3  METHOD RK4  STARTTIME = 0  STOPTIME=100  DT = 0.02  Dose = 1  thalf = 6 ; h  thalfabs = 2 ; h  V = 25 ; L  k = LOGN(2)/thalf  ka = LOGN(2)/thalfabs  CL = k\*V ; L/h  ;Dose regimen  tau = 12 ; Dosing interval  In = pulse(Dose,12,tau)  ;Differential equation  d/dt(D) = In - ka\*D  d/dt(A1) = ka\*D - k\*A1  C = A1/V  init D = Dose ;Initialization of D = Dose  init A1 = 0 ;Initialization of A1 = 0 |

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| ;Computer lab 1:4  METHOD RK4  STARTTIME = 0  STOPTIME=100  DT = 0.02  Dose = 1  thalf = 6 ; h  thalfabs = 2 ; h  V = 25 ; L  k = LOGN(2)/thalf  ka = LOGN(2)/thalfabs  CL = k\*V ; L/h  ;Dose regimen  tau = 12 ; Dosing interval  ;In = pulse(Dose,0,tau)  ;Zero order absorption  tin = 3  In = if mod(time,tau) <= tin then  Dose/tin  else  0  ; note that mod is the remainder of time/tau!  ;Differential equation  d/dt(A1) = In - k\*A1 ;Zero order absorption  C = A1/V  init A1 = 0 ;Initialization of A1 = 0 |

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| ;Computer lab 1:5  METHOD RK4  STARTTIME = 0  STOPTIME=100  DT = 0.02  Dose = 1  thalf = 6 ; h  thalfabs = 2 ; h  V = 25 ; L  k = LOGN(2)/thalf  ka = LOGN(2)/thalfabs  CL = k\*V ; L/h  ;Dose regimen  tau = 24 ; Dosing interval  In1 = pulse(Dose,8,tau)  In2 = pulse(Dose,12,tau)  In3 = pulse(Dose,18,tau)  ;Differential equation  d/dt(D) = In1 + In2 + In3 - ka\*D  d/dt(A1) = ka\*D - k\*A1  C = A1/V  init D = 0 ;Initialization of D = 0  init A1 = 0 ;Initialization of A1 = 0 |

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| ;Computer lab 1:6  METHOD RK4  STARTTIME = 0  STOPTIME = 1440 ;1440 min = 24 hours  DT = 0.02  Dose = 1  thalf = 6\*60 ; min  thalfabs = 2\*60 ; min  V = 25\*10\*\*3 ; mL  k = LOGN(2)/thalf  ka = LOGN(2)/thalfabs  CL = k\*V ; mL/min  ;Dose regimen  tau = 24\*60 ; Dosing interval (min)  In = pulse(Dose,0,tau)  fe = 0.7 ; Fraction excreted in urine  x = 0.3 ; Relation between CLr and CRCL  CRCL\_norm = 120 ; mL/min Normal CRCL  CRCL = 120 ; Creatinine CL  CLr = x\*CRCL ; Renal clearance  CLh = CL - x\*CRCL\_norm ; Hepatic clearance  CLtot = CLr + CLh ; Total CL, the renal function incorporated  ke = (CLtot\*fe + CLtot\*(1-fe))/V ; Rate constant for the total elimination  ;Differential equations  d/dt(D) = In - ka\*D  d/dt(A1) = ka\*D - ke\*A1  C = A1/V  init D = 0 ;Initialization of D = 0  init A1 = 0 ;Initialization of A1 = 0 |