

```

*EX1**2*((75.)/(1408.)-(15.)/(256.)*SIN(EI1)*SIN(EI1))
**SIN(EI1)*SIN(EI1)*COS(4.*W1))
WRITE(5,10)EI2
10  FORMAT(5X,'EI2 = ',E15.10,2X,'RAD')
    EI2D=EI2*((180)/PI)
    WRITE(5,19)EI2D
19  FORMAT(/5X,'EI2 = ',F15.10,2X,'DEGREE')
    DEI=EI2
    WRITE(5,919)DEI
919  FORMAT(/5X,'DELT I = ',E15.10)
C    EIC=EI2+EI1
    DEI=DEI*DN1
    WRITE(5,44)DEI
44  FORMAT(/5X,'DELT I PER DAY = ',E15.10)
    DEI=DEI*(T2-T1)
    EI2H=EI1+DEI
    DEI2=EI2H-EI2S
    CRATIO=(DEI2/EI2S)*100
    WRITE(5,601)CRATIO
    EI2HD=EI2H*((180)/PI)
    WRITE(5,31)EI2HD
31  FORMAT(/5X,'EI2H = ',F15.10,2X,'DEGREE')
    WRITE(5,87)DEI,EI2H,DEI2
87  FORMAT(/1X,'DEI=',E13.8,1X,'EI2H=',E13.8,1X,'DEI2=',
*E13.8,1X,'REDIAN')
    DII=DEI2*((180)/(PI))
    WRITE(5,68)DII
68  FORMAT(/2X,'DIFFERENT IN (I) BY DEGREE = ',E15.9
    1,2X,'DEGREE')
    O2=O2+((-3./2.*AJ2)/(A1*A1*(1.-EX1*EX1)**2))*COS(EI1)*
* (EX1*SIN(F1)-(1./2.)*SIN(2.*F1+2.*W1)-(EX1/6.)*SIN(3.*
*F1+2.*W1)-(EX1/2.)*SIN(F1+2.*W1))-((3./2.)*AJ2)/(A1*A1
** (1.-EX1*EX1)**2)*COS(EI1)*F1
    O2=O2+(COS(EI1)/(4.-5.*SIN(EI1)*SIN(EI1)))*(((3.
*2.)*AJ2*A1*(1.-EX1*EX1))*EX1*(3./SIN(EI1)-(15.)/4*
*SIN(EI1))*COS(W1)+((-35.)/8*AJ4)/((3./2.)*AJ2*A1*A1*
*(1.-EX1*EX1)**2))*((3.*SIN(EI1)*SIN(EI1)-(12.)/7)*W1+
*EX1*EX1*(9./2*SIN(EI1)*SIN(EI1)-(18.)/7)*W1+((EX1*EX1)/
*(4.-5.*SIN(EI1)*SIN(EI1)))*((18.)/7-6*SIN(EI1)*SIN(EI1)+
*(15.)/4*(SIN(EI1))**4)*SIN(2.*W1))
    O2=O2+(COS(EI1)/(4.-5.*SIN(EI1)*SIN(EI1)))*(((63.)/8*AJ5)
*/((3./2.)*AJ2*A1**3*(1.-EX1*EX1)**3))*((EX1/(4.-5.*
*SIN(EI1)*SIN(EI1)))*((-80.)/(21.*SIN(EI1))+(740.)/(21)*
*SIN(EI1)-(200.)/3*(SIN(EI1))**3+(75.)/2*(SIN(EI1))**5)*
*COS(W1)+((EX1**3)/(4.-5.*SIN(EI1)*SIN(EI1)))*((-20.)/(7*
*SIN(EI1))+(185.)/7*SIN(EI1)-50.*(SIN(EI1))**3+(225.)/8*
*(SIN(EI1))**5)*COS(W1)+((EX1**3)/(4.-5.*SIN(EI1)*SIN(EI1)
*)))*((-10.)/9*SIN(EI1)+(275.)/(108)*(SIN(EI1))**3-(25.)
*/(16)*(SIN(EI1))**5)*COS(3*W1))
    O2=O2+(COS(EI1)/(4.-5.*SIN(EI1)*SIN(EI1)))*(((231.)/(16)*
*AJ6)/((3./2)*AJ2*A1**4*(1.-EX1*EX1)**4))*((-10.)/(11)+
*(45.)/(11)*SIN(EI1)*SIN(EI1)-(15.)/4*(SIN(EI1))**4)*W1+
*(EX1*EX1)*((-50.)/(11)+(225.)/(11)*SIN(EI1)*SIN(EI1)-
*(75.)/4*(SIN(EI1))**4)*W1+(EX1**4)*((-75.)/(44)+(675.)/
*(88)*SIN(EI1)*SIN(EI1)-(225.)/(32)*(SIN(EI1))**4)*W1+
*((EX1**2)/(4.-5.*SIN(EI1)*SIN(EI1)))*((50.)/(11)-(300.)
*/(11)*SIN(EI1)*SIN(EI1)+(3975.)/(88)*(SIN(EI1))**4-
*(375.)/(16)*(SIN(EI1))**6)*SIN(2.*W1)+((EX1**4)/(4.-5.*
*SIN(EI1)*SIN(EI1)))*((25.)/(11)-(150.)/(11)*SIN(EI1)*
*SIN(EI1)+(3975.)/(176.)*(SIN(EI1))**4-(375.)/(32)*

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*(SIN(EI1))**6)*SIN(2.*W1)+((EX1**4)/(4.-5.*SIN(EI1))*
*SIN(EI1)))*((75.)/(176.)*SIN(EI1)*SIN(EI1)-(2025.)/
*(1408)*(SIN(EI1))**4+(75.)/(64)*(SIN(EI1))**6)*SIN(4.*W1))
*-( ((3./2.)*AJ2)/(A1*A1*(1.-EX1*EX1)**2))*(((-10.)/3*
*SIN(EI1)*SIN(EI1)+3)*W1+(EX1*EX1)*((5/(12.))*SIN(EI1)*
*SIN(EI1)+1./3.)*W1+((EX1*EX1)/(4.-5.*SIN(EI1)*SIN(EI1)))*
*(7./3-5.*SIN(EI1)*SIN(EI1)+(25.)/8*(SIN(EI1))**4)*SIN(2
**W1)))-(((10.)*SIN(EI1))/(4.-5.*SIN(EI1)*SIN(EI1)))*(EI1-
*B3)*W1
WRITE(5,*) '-----'
WRITE(5,911)O2
911  FORMAT(2X,'O2 = ',F15.10)
DO=O2
DO=DO*DN1
DO=DO*(T2-T1)
O2H=O1+DO
O2HD=O2H*((180)/PI)
WRITE(5,77)O2HD
77  FORMAT(/5X,'O2H = ',E15.10,2X,'DEGREE')
DO2=O2H-O2S
ORATIO=(DO2/O2S)*100
WRITE(5,601)ORATIO
DOO=DO2*((180)/PI)
WRITE(5,41)DO,O2H
41  FORMAT(/2X,'DO= ',E17.9,2X,'O2H= ',E17.9)
WRITE(5,444)DO2,DOO
444  FORMAT(/2X,'DO2 = ',E17.9,2X,'RADIN',2X,'DOO = '
1,E17.10,2X,'DEGREE')
W2=W2+(((3./2.)*AJ2)/(A1*A1*(1.-EX1*EX1)**2))*((2.-5./2.*
*SIN(EI1)*SIN(EI1))*EX1*SIN(F1)+(1.-((3./2.)*SIN(EI1)*
*SIN(EI1))*((1./EX1-EX1/4.)*SIN(F1)+(1./2.)*SIN(2.*F1)+
*(EX1/(12.))*SIN(3.*F1))-((1./((4.*EX1))*SIN(EI1)*SIN(EI1)+
*(1./2.-((15.)/(16.))*SIN(EI1)*SIN(EI1))*EX1)*SIN(F1+2.*W1)
*-(1./2.-((5./4.)*SIN(EI1)*SIN(EI1))*SIN(2.*F1+2.*W1)+((7./
*(12.*EX1))*SIN(EI1)*SIN(EI1)-(1./6.-((19.)/(48.))*SIN(EI1)*
*SIN(EI1))*EX1)*SIN(3.*F1+2.*W1)+(3./8.)*SIN(EI1)*SIN(EI1)*
*SIN(4.*F1+2.*W1)+(EX1/(16.))*SIN(EI1)*SIN(EI1)*(SIN(5.*F1+
2.*W1)+SIN(F1-2.*W1)))+(2.-((5./2.)*SIN(EI1)*SIN(EI1))*F1)
W2=W2+((-AJ3)/((3./2.)*AJ2*A1*(1.-EX1*EX1)*(4.-5.*SIN(EI1)
**SIN(EI1)))*((1./EX1*(3*SIN(EI1)-((15.)/4.)*(SIN(EI1))**3)
**EX1*(-3./SIN(EI1)+(27.)/4*SIN(EI1)-(15.)/4*(SIN(EI1))**3))
**COS(W1)
W2=W2+(((((-35.)/8)*AJ4)/((3./2.)*AJ2*A1*A1*(1.-EX1*EX1)**2*
*(4.-5.*SIN(EI1)*SIN(EI1)))*(((24.)/7+(21.)/2*(SIN(EI1))**
*4-(93.)/7*SIN(EI1)*SIN(EI1)+(EX1*EX1)*((27.)/7-(27.)/2*
*SIN(EI1)*SIN(EI1)+(81.)/8*(SIN(EI1))**4))*W1+((9/(14.)*
*SIN(EI1)*SIN(EI1)-(3./4.)*(SIN(EI1))**4)+((EX1*EX1)/(4.-5.
**SIN(EI1)*SIN(EI1)))*((-18.)/7+(69.)/7*SIN(EI1)*SIN(EI1)-
*(90.)/7*(SIN(EI1))**4+(45.)/8*(SIN(EI1))**6))*SIN(2.*W1))
W2=W2+(((((-63.)/8)*AJ5)/((3./2.)*AJ2*A1**3*(1.-EX1*EX1)**3
**((4.-5.*SIN(EI1)*SIN(EI1)))*((1./EX1*((-20)/(21)*
*SIN(EI1)+(10.)/3*(SIN(EI1))**3-(5./2)*(SIN(EI1))**5)+(EX1/
*(4.-5.*SIN(EI1)*SIN(EI1)))*((80.)/(21.*SIN(EI1))-(440.)/7*
*SIN(EI1)+215.*(SIN(EI1))**3-(1625.)/6*(SIN(EI1))**5+(925.)
*/8*(SIN(EI1))**7)+((EX1**3)/(4.-5.*SIN(EI1)*SIN(EI1)))*
*((20)/(7.*SIN(EI1))-35.*SIN(EI1)+(725.)/7*(SIN(EI1))**3-
*(945.)/8*(SIN(EI1))**5+(375.)/8*(SIN(EI1))**7))*COS(W1)+
*(EX1*((-5.)/(18))*SIN(EI1))**3+5/(16.)*(SIN(EI1))**5)+
*((EX1**3)/(4.-5.*SIN(EI1)*SIN(EI1)))*((10.)/9*SIN(EI1)-
*(475.)/(108)*(SIN(EI1))**3+(845.)/(144)*(SIN(EI1))**5-

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*(125.)/(88)*(SIN(EI1))**7))*COS(3.*W1))
W2=W2+((231.)/(16)*AJ6)/((3./2.)*AJ2*A1**4*(1.-EX1*EX1)**4
** (4.-5.*SIN(EI1)*SIN(EI1)))*(((20.)/(11)-(160.)/(11)*
*SIN(EI1)*SIN(EI1)+(645.)/(22)*(SIN(EI1))**4-(135.)/8*
*(SIN(EI1))**6)+(EX1*EX1)*((75.)/(11)-(1075.)/(22)*SIN(EI1)
**SIN(EI1)+(8175.)/(88)*(SIN(EI1))**4-(825.)/(16)*(SIN(EI1))
**6)+(EX1**4)*((25.)/(11)-(675.)/(44)*SIN(EI1)*SIN(EI1)+
*(2475.)/(88)*(SIN(EI1))**4-(945.)/(64)*(SIN(EI1))**6))*
*W1+(((25.)/(22)*SIN(EI1)*SIN(EI1)-(75.)/(22)*(SIN(EI1))**4
*+(75.)/(32)*(SIN(EI1))**6)+((EX1*EX1)/(4.-5.*SIN(EI1)*
*SIN(EI1)))*((-50)/(11.)+(525.)/(11)*SIN(EI1)*SIN(EI1)-
*(12325.)/(88)*(SIN(EI1))**4+(14175.)/(88)*(SIN(EI1))**6-
*(4125.)/(64)*(SIN(EI1))**8)+((EX1**4)/(4.-5.*SIN(EI1)*
*SIN(EI1)))*((-25.)/(11)+(425.)/(22)*SIN(EI1)*SIN(EI1)-
*(8925.)/(176)*(SIN(EI1))**4+(9525.)/(176)*(SIN(EI1))**6-
*(2625.)/(128)*(SIN(EI1))**8))*SIN(2.*W1)+((EX1*EX1)*((75.)/
*(704)*(SIN(EI1))**4-(15.)/(128.)*(SIN(EI1))**6)+((EX1**4)/
*(4.-5.*SIN(EI1)*SIN(EI1)))*((-75.)/(176)*SIN(EI1)*SIN(EI1)
*+(2415.)/(1408)*(SIN(EI1))**4-(6495.)/(2816)*(SIN(EI1))**
*6+(525.)/(512.)*(SIN(EI1))**8))*SIN(4.*W1))
W2=W2+(((3./2.)*AJ2)/(A1*A1*(1.-EX1*EX1)**2*(4.-5.*SIN(EI1)
**SIN(EI1)))*(((8.-(103.)/6*SIN(EI1)*SIN(EI1)+(215.)/(48)*
*(SIN(EI1))**4)+(EX1*EX1)*(7./6-(3./4)*SIN(EI1)*SIN(EI1)-
*(15.)/(16)*(SIN(EI1))**4))*W1+(((25.)/(12)*SIN(EI1)*
*SIN(EI1)+5./2.*(SIN(EI1))**4)+((EX1*EX1)/(4.-5.*SIN(EI1)
**SIN(EI1)))*(7./3-(17.)/2*SIN(EI1)*SIN(EI1)+(65.)/6*
*(SIN(EI1))**4-(75.)/(16.)*(SIN(EI1))**6))*SIN(2.*W1))
W2=W2+((2.*(13.-15.*SIN(EI1)*SIN(EI1)))/(4.-5.*SIN(EI1)*
*SIN(EI1)))*TAN(EI1)*(EI1-B3)*W1
WRITE(5,*)'-----'
WRITE(5,47)W2
47  FORMAT(5X,'W2 = ',E17.10)
    DW=W2
    DW=DW*DN1
    DW=DW*(T2-T1)
    W2H=W1+DW
    W2HD=W2H*((180)/PI)
    WRITE(5,72)W2HD
72  FORMAT(/5X,'W2H = ',E17.10,2X,'DEGREE')
    DW2=W2H-W2S
    WRATIO=(DW2/W2S)*100
    WRITE(5,601)WRATIO
    DW12=DW2*((180)/PI)
    WRITE(5,57)DW,W2H,DW2
57  FORMAT(/1X,'DW=',E19.8,1X,'W2H=',E17.8,1X,'DW2=',
    *E17.8,1X,'RED')
    WRITE(5,46)DW12
46  FORMAT(/5X,'DW12 = ',E19.10,2X,'DEGREE')
    WRITE(5,*)'-----'
    AM2=AM2+(((3./2.)*AJ2)/(A1*A1*(1.-EX1*EX1)**2))*SQRT(1.-
    1EX1*EX1)*((1.-(3./2.)*SIN(EI1)*SIN(EI1))*((5.*EX1)/4-
    1(1./EX1))*SIN(F1)-(1./2)*SIN(2.*F1)-EX1/(12.)*SIN(3.*F1))
    1+(1./(4.*EX1)+(17.)/(16.)*EX1)*SIN(EI1)*SIN(EI1)*SIN(F1+
    12.*W1)+(3./4.)*SIN(EI1)*SIN(EI1)*SIN(2.*F1+2.*W1)-(7.)/(12.
    1*EX1)-(13.)/(48.)*EX1)*SIN(EI1)*SIN(EI1)*SIN(3.*F1+2.*W1)-
    1(3./8.)*SIN(EI1)*SIN(EI1)*SIN(4.*F1+2.*W1)-(EX1/(16.))*SIN
    1(EI1)*SIN(EI1)*(SIN(5.*F1+2.*W1)+SIN(F1-2.*W1))+1.-(3./2.))
    1*SIN(EI1)*SIN(EI1))*F1)
    write(5,917)am2
917  FORMAT(/5X,'AMM = ',E17.10)

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AM2=AM2+((-AJ3)/((3./2.)*AJ2*A1*(1.-EX1*EX1)))*SQRT(1.-EX1*
1EX1)*(-3/(4.*EX1)+3.*EX1)*SIN(EI1)*COS(W1)
write(5,917)am2
AM2=AM2+(((((-35.)/8)*AJ4)/((3./2.)*AJ2*(4.-5.*SIN(EI1)*SIN(
1EI1))*A1*A1*(1.-EX1*EX1)**2))*SQRT(1.-EX1*EX1)*((EX1*EX1)*
1(9./4.-((45.)/7.*SIN(EI1)*SIN(EI1)+(45.)/8*(SIN(EI1))**4)*W1
1+((-9.)/(14.)*SIN(EI1)*SIN(EI1)+(3./4.)*(SIN(EI1))**4)*(1.-
1(5./2.)*(EX1*EX1))*SIN(2.*W1))
write(5,917)am2
AM2=AM2+(((((-63.)/8.)*AJ5)/((3./2.)*AJ2*A1**3*(1.-EX1*EX1)
1**3*(4.-5.*SIN(EI1)*SIN(EI1))))*SQRT(1.-EX1*EX1)*(((1./EX1)
1*((20.)/(21)*SIN(EI1)-(10.)/3.*(SIN(EI1))**3+(5./2.)*(SIN(
1EI1))**5)+EX1*((-5./3.)*SIN(EI1)+(35.)/6*(SIN(EI1))**3-(35.
1)/8.*(SIN(EI1))**5)+(EX1**3)*((-30.)/7.*SIN(EI1)+15.*(SIN(
1EI1))**3-(45.)/4.*(SIN(EI1))**5))*COS(W1)+(EX1*(5.)/(18.)*
1(SIN(EI1))**3-5.)/(16.)*(SIN(EI1))**5)+(EX1**3)*((-5./9)*
1(SIN(EI1))**3+(5./8.)*(SIN(EI1))**5))*COS(3.*W1))
WRITE(5,917)AM2
AM2=AM2+((((231.)/(16.))*AJ6)/((3./2.)*AJ2*A1**4*(1.-EX1*
1EX1)**4*(4.-5.*SIN(EI1)*SIN(EI1))))*SQRT(1.-EX1*EX1)*(((((-
12./3)+(35.)/(11.)*SIN(EI1)*SIN(EI1)-(315.)/(44.)*(SIN(EI1))
1**4+(35.)/8*(SIN(EI1))**6)+(EX1*EX1)*((-35.)/(33.)-(175.)/
1(22.)*SIN(EI1)*SIN(EI1)+(1575.)/(88.)*(SIN(EI1))**4-(175.)/
1(16.)*(SIN(EI1))**6)+(EX1**4)*((-5.)/(44.)-(525.)/(88.)*
1SIN(EI1)*SIN(EI1)+(4725.)/(352.)*(SIN(EI1))**4-(525.)/(64.)*
1*(SIN(EI1))**6))*W1+(((((-25.)/(22.)*SIN(EI1)*SIN(EI1)+(75.)/
1(22.)*(SIN(EI1))**4-(75.)/(32.)*(SIN(EI1))**6)+(EX1*EX1)*
1((75.)/(44.)*SIN(EI1)*SIN(EI1)-(225.)/(44.)*(SIN(EI1))**4+
1(225.)/(64.)*(SIN(EI1))**6)+(EX1**4)*((175.)/(88.)*SIN(EI1)
1*SIN(EI1)-(525.)/(88.)*(SIN(EI1))**4)+(525.)/(128.)*(SIN(EI1)
1))**6))*SIN(2.*W1)+((EX1*EX1)*((-75.)/(704.)*(SIN(EI1))**4+
1(15.)/(128.)*(SIN(EI1))**6)+(EX1**4)*((525.)/(2816.)*(SIN(
1EI1))**4-(105.)/(512.)*(SIN(EI1))**6))*SIN(4.*W1))
WRITE(5,917)AM2
AM2=AM2+(((3./2.)*AJ2)/(A1*A1*(1.-EX1*EX1)**2)*SQRT(1.-EX1
1*EX1)*(4.-5.*SIN(EI1)*SIN(EI1)))*((((25.)/(12.)*SIN(EI1)*
1SIN(EI1)-(5./2.)*(SIN(EI1))**4)+(EX1*EX1)*((-31.)/6*SIN(EI1)
1)*SIN(EI1)+(49.)/8*(SIN(EI1))**4)+(EX1**4)*((53.)/(24.)*
1SIN(EI1)*SIN(EI1)-(37.)/(16.)*(SIN(EI1))**4))*SIN(2.*W1)-3.
1/(512.)*(EX1**4)*(SIN(EI1))**4*SIN(4.*W1)+(((10.)/3.-((23.)/
13.*SIN(EI1)*SIN(EI1)+(49.)/(12.)*(SIN(EI1))**4)+(EX1*EX1)*
1((-10.)/3.+(31.)/3.*SIN(EI1)*SIN(EI1)-(113.)/(12.)*(SIN(EI1)
1))**4)+(EX1**4)*((-35.)/(24.)+(41.)/(24.)*SIN(EI1)*SIN(EI1)
1+(79.)/(192.)*(SIN(EI1))**4))*W1+(1.-EX1*EX1)*SIN(EI1)*SIN
1(EI1)*(3.-((15.)/4.)*(SIN(EI1))**4)*SIN(2.*F1+2.*W1)+EX1*
1SIN(F1-2.*W1)+(EX1/3.)*SIN(3.*F1+2.*W1))+(((1.-EX1*EX1)**
1(5./2.)*(2.-3.*SIN(EI1)*SIN(EI1)))/(2.*(4.-5.*SIN(EI1)*SIN
1(EI1))*A1*A1*(1.-EX1*EX1)**2))*(A1-B1)*A1*W1
WRITE(5,917)AM2
WRITE(5,74)AM2
74  FORMAT(/5X,'AM2 = ',E18.10)
DM=AM2
DM=DM*DN1
DM=DM*(T2-T1)
WRITE(5,424)DM
424  FORMAT(5X,'DM = ',E19.10,'RAD')
DMR=DM/(2.*PI)
DMR=DMR+DN1*(T1-T0)
WRITE(5,27)DMR
27  FORMAT(/5X,'DMR = ',E19.10,2X,'REVOLUTION')

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```

AM2H=AM1/(2.*PI)+DMR
WRITE(5,405)AM2H
405  FORMAT(/5X,'AM2H = ',F19.9)
NR=IFIX(AM2H)
WRITE(5,712)NR
712  FORMAT(5X,'NR = ',I4)
RR=NR
WRITE(5,812)RR
812  FORMAT(5X,'RR = ',F15.10)
RN=AM2H-RR
WRITE(5,626)RN
626  FORMAT(/5X,'RN = ',E19.10)
AM2H=RN
DAM2=AM2H-AM2S
AMRATIO=(DAM2/AM2S)*100
WRITE(5,601)AMRATIO
WRITE(5,75)AM2H
75   FORMAT(/5X,'AM2H = ',E17.9)
WRITE(5,416)DAM2
416  FORMAT(/3X,'DAM2=',E16.9,1X,'REVOLUTION')
STOP
END
SUBROUTINE KEP(AM,EX,A,F,R)
PI=(22.)/7.
E=AM
E1=E+EX*SIN(E)
2    E2=E+EX*SIN(E1)
EE=E2-E1
IF(EE.LT.0.1E-6) GO TO 1
E1=E2
GO TO 2
1    WRITE(5,7)E2
C    F=2*ATAN(SQRT((1.+EX)/(1.-EX))*TAN(E2/2.))
C    R=(A*(1.-EX**2))/(1.+EX*COS(F))
7    FORMAT(5X,'E2 = ',E15.10)
R=A*(1.-EX*COS(E2))
SF=((A*SQRT(1.-EX*EX))/R)*SIN(E2)
CF=(A*(COS(E2)-EX))/R
IF(SF.GT.0.0.AND.CF.GT.0.0) GO TO 5
IF(SF.GT.0.0.AND.CF.LT.0.0) GO TO 6
IF(SF.LT.0.0.AND.CF.LT.0.0) GO TO 9
IF(SF.LT.0.0.AND.CF.GT.0.0) GO TO 13
WRITE(5,17)
17   FORMAT('THE MOTHED FAIL')
5    F=ASIN(SF)
FD=F*((180)/PI)
GO TO 68
6    F=ASIN(SF)
F=F*((180)/(PI))
F=ABS(F)
F=180-F
FD=F
F=F*((PI)/(180))
GO TO 68
9    F=ASIN(SF)
F=F*((180)/(PI))
F=ABS(F)
F=180+F
FD=F
F=F*((PI)/(180))

```

```
GO TO 68
13  F=ASIN(SF)
    F=F*((180)/(PI))
    F=ABS(F)
    F=360-F
    FD=F
    F=F*((PI)/(180))
68  WRITE(5,4)F,SF,CF
    WRITE(5,14)FD
4   FORMAT(1X,'F=',E14.8,1X,'SIN(F)=',E14.8,
11X,'COS(F)=',E14.8)
14  FORMAT(2X,'FD = ',E13.8)
    RETURN
    END
```

APPENDIX (IV): COMPUTER PROGRAM FOR SOLVING QUINTIC EQUATION BY
USING THE GAUSS QUADRATURE RULE (with $n=1,2,4,8,16$ nodes).

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DIMENSION K(6),L(6),M(6),C(6),B(6),A(6),X(16),A2(16),
1XR(4),X1(4),BX(6)
DATA K/5,4,3,2,1,0/
C    CALL OPEN (5,'RESS.OUT','NEW')
C    DO 54 I=1,50
C    LIN(I)='*'
C54  CONTINUE
999  FORMAT(2X,'*',5X,'M1=',F3.1,5X,'M2='
*,F3.1,5X,'M3=',F3.1)
71  FORMAT(2X,'*',20X,'LAGRANGE QUINTIC EQUATION')
c717 FORMAT(2X,'*',2X,'WHEN THE THREE BODIES'/2X,'*',
c    '*ARE ALL ON STRNIGHT LINE')
C72  FORMAT(2X,'*',25X,20A1)
c73  FORMAT(2X,'*', '(M1+M2)*Y**5+(3M1+2M2)*Y**4*X+'
c    '*/2X,'*', '(3M1+M2)*Y**3*X**2-'//2X,'*', '-(M2+3M)'
c    '*Y**2*X**3-(2M2+3M3)*Y*X**4-/2X,'*',
c    '* (M2+M3)*X**5=0')
c74  FORMAT(2X,'*', 'WHERE {M1,M2,M3} ARE THE MASSES'
c    */2X,'*', 'OF THE THREE BODIES')
c75  FORMAT(2X,'*', 'AND {X} IS THE DISTANCE BETWEEN',
c    '*{M1,M2}'//2X,'*', '{Y} IS THE DISTANCE',
c    '*BETWEEN {M2,M3}')
c77  FORMAT(2X,'*', 'PUT {Y/X=Z} THEN THE EQUATION TAKE'
c    *, 'THE FORM')
c78  FORMAT(2X,'*', '(M1+M2)*Z**5+(3M1+2M2)*Z**4+(3M1+'
c    *, 'M2)*Z**3-/2X,'*', '(M2+3M3)*Z**2-(2M2+3M3)*Z-(M2+M3)=0')
c81  FORMAT(2X,'*', 'WE NOW SOLVING THIS EQUATION BY'
c    */2X,'*', 'USING GAUSS QUADRATURE')
C83  FORMAT(2X,40A1)
C    WRITE(5,83)(LIN(I),I=1,40)
C    WRITE(5,71)
c    WRITE(5,717)
C    WRITE(5,72)(LIN(I),I=1,20)
c    WRITE(5,73)
c    WRITE(5,74)
c    WRITE(5,75)
c    WRITE(5,77)
c    WRITE(5,78)
c    WRITE(5,81)
AM1=1.
AM2=3.
AM3=5.
C    DO 290 IM=1,4
C    DO 290 IM1=2,5
C    IF(IM1.LE.IM) GO TO 290
C    DO 190 IM2=3,6
C    IF(IM2.LE.IM1) GO TO 190
C    IF(IM2.LE.IM) GO TO 190
C    AM1=IM
C    AM2=IM1
C    AM3=IM2
C    WRITE(5,83)(LIN(I),I=1,40)
C    WRITE(5,999)AM1,AM2,AM3
C    DO 12 I=1,6
C    B(I)=0.0

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