Chapter 6
Solved Problems

Problem 1

Command Window:

1.*a*
```
>> 5+3>32/4
ans =
     0
>> y=2*3>10/5+1>2^2
y =
     0
>> y=2*(3>10/5)+(1>2)^2
y =
     2
>> 5*3-4*4<=~2*4-2+~0
ans =
     1
```

Problem 2

Script file:

```
a=6; b=2; c=-5;
disp('Part (a)')
y=a+b>a-b<c
disp('Part (b)')
y=-6<c<-2
disp('Part (c)')
y=b+c>=c>a/b
disp('Part (d)')
y=a+c==~(c+a~=a/b-b)
```

Command Window:

```
Part (a)
y =
     0
Part (b)
y =
     0
Part (c)
y =
     0
Part (d)
y =
     1
```

Problem 3

Script file:

```
v=[4 -2 -1 5 0 1 -3 8 2];
u=[0 2 1 -1 0 -2 4 3 2];
disp('Part (a)')
~(~v)
disp('Part (b)')
u==v
disp('Part (c)')
u-v<u
disp('Part (d)')
u-(v<u)
```

Command Window:

```
Part (a)
ans =
     1     1     1     1     0     1     1     1     1
Part (b)
ans =
     0     0     0     0     1     0     0     0     1
Part (c)
ans =
     1     0     0     1     0     1     0     1     1
Part (d)
ans =
     0     1     0    -1     0    -2     3     3     2
```

Problem 4

<u>Command Window:</u>
```
>> v=[4 -2 -1 5 0 1 -3 8 2];
>> w=[0 2 1 -1 0 -2 4 3 2];
>> y=w(w<v)
y =
     0    -1    -2     3
```

Problem 5

<u>Command Window:</u>

```
>> 0&21
ans =
     0
>> ~-2>-1&11>=~0
ans =
     1
>> 4-7/2&6<5|-3
ans =
     1
>> 3|-1&~2*-3|0
ans =
     1
```

Problem 6

<u>Script File:</u>
```
TCH=[75 79 86 86 79 81 73 89 91 86 81 82 86 88 89 90 82 84 81
79 73 69 73 79 82 72 66 71 69 66 66];
TSF=[69 68 70 73 72 71 69 76 85 87 74 84 76 68 79 75 68 68 73
72 79 68 68 69 71 70 89 95 90 66 69];
%part a
disp('Part (a)')
TCHave=mean(TCH)
TSFave=mean(TSF)
% part b
disp('Part (b)')
TCHaboveAVE=sum(TCH>TCHave)
TSFaboveAVE=sum(TSF>TSFave)
% part c
disp('Part (c)')
TSFlowerTCH=sum(TSF<TCH)
dayTSFlowerTCH=find(TSF<TCH)
% part d
disp('Part (d)')
TSFsameTCH=sum(TSF==TCH)
dayTSFsameTCH=find(TSF==TCH)
```

<u>Command Window:</u>
```
Part (a)
TCHave =
   79.1290
TSFave =
   74.5484
Part (b)
TCHaboveAVE =
    16
TSFaboveAVE =
    11
Part (c)
TSFlowerTCH =
    23
dayTSFlowerTCH =
```

```
      1      2      3      4      5      6      7      8      9     11
13    14     15     16     17     18     19     20     22     23     24
25    26
Part (d)
TSFsameTCH =
     1
dayTSFsameTCH =
    30
```

Problem 7

<u>Script File:</u>

```
A(1)=0; A(2)=1;
n=20;
for i=3:n
    A(i)=A(i-2)+A(i-1);

end
A
```

<u>Command Window:</u>

```
A =
  Columns 1 through 7
         0            1            1            2            3
5            8
  Columns 8 through 14
        13           21           34           55
89         144          233
  Columns 15 through 20
       377          610          987         1597
2584        4181
```

Problem 8

Script File:

```
for i=1:4
    for j=1:3
        A(i,j)=(i+j)/j^2;
    end
end
A
```

Command Window:

```
A =
    2.0000    0.7500    0.4444
    3.0000    1.0000    0.5556
    4.0000    1.2500    0.6667
    5.0000    1.5000    0.7778
```

Problem 9

Script File:

```
n=4;
for i=1:n
    for j=1:n
        A(i,j)=factorial(i+j-2)/(factorial(i-1)*factorial(j-
1));
    end
end
A
```

Command Window:

```
A =
     1     1     1     1
     1     2     3     4
     1     3     6    10
     1     4    10    20
```

Executing the script file with *n*=7:

```
A =
     1     1     1     1     1     1     1
     1     2     3     4     5     6     7
     1     3     6    10    15    21    28
     1     4    10    20    35    56    84
     1     5    15    35    70   126   210
     1     6    21    56   126   252   462
     1     7    28    84   210   462   924
```

Problem 10

Script File:

```
A(1,1)=2; A(1,2)=3;
n=4;
for i=1:n
    if i==1
    for j=3:n
        A(i,j)=A(i,j-2)+A(i,j-1);
    end
    else
        A(i,1)=A(i-1,n-1)+A(i-1,n);
        A(i,2)=A(i-1,n)+A(i,1);
        for j=3:n
        A(i,j)=A(i,j-2)+A(i,j-1);
        end
    end
end
A
```

Command Window:

Executing the program and calculating the determinant of A:

```
A =
           2             3             5             8
          13            21            34            55
          89           144           233           377
         610           987          1597          2584
>> det(A)
ans =
 -9.7622e-030
```

Executing the program with begining numbers 1 and 4, and calculating the determinant of A:

```
A =
            1             4             5             9
14          23          37
           60          97          157          254
411        665        1076
          1741        2817          4558          7375
11933      19308        31241
50549   81790   1.3234e+005   2.1413e+005   3.4647e+005
5.606e+005 9.0707e+005
1.4677e+006    2.3747e+006    3.8424e+006    6.2171e+006
1.006e+007 1.6277e+007 2.6336e+007
4.2613e+007    6.8949e+007    1.1156e+008    1.8051e+008
2.9207e+008 4.7258e+008 7.6465e+008
1.2372e+009    2.0019e+009    3.2391e+009     5.241e+009
8.4802e+009 1.3721e+010 2.2201e+010
>> det(A)
ans =
     0
```

Problem 11

<u>Script File:</u>

```
a=input('Enter the constant a  ');
b=input('Enter the constant b  ');
c=input('Enter the constant c  ');
D=b^2-4*a*c;
if D<0
    disp('The equation has no real roots.')
elseif D==0
        x=-b/(2*a);
        fprintf('The equation has one root: x = %f\n',x)
    else
        x1=(-b+sqrt(D))/(2*a);
        x2=(-b-sqrt(D))/(2*a);
        fprintf('The equation has two roots:\n')
        fprintf('x1 = %f,  x2 = %f\n',x1, x2)
end
```

<u>Command Window:</u>

```
11.a
Enter the constant a  2
Enter the constant b  8
Enter the constant c  8
The equation has one root: x = -2.000000

11.b
Enter the constant a  -5
Enter the constant b  3
Enter the constant c  -4
The equation has no real roots.

11.c
Enter the constant a  -2
Enter the constant b  7
Enter the constant c  4
The equation has two roots:
x1 = -0.500000,  x2 = 4.000000
```

Problem 12

Script File:

```
i=132^2;
for n=i:2*i
    if (rem(n,2)~=0) & (rem(n,11)==0) & (sqrt(n)>132)
        break
    end
end
fprintf('The required number is:  %i\n',n)
```

Command Window:

```
The required number is:  17435
```

Problem 13

Script File:

```
m=input('Enter a value (integer) for m  ');
S=0;
for n=0:m
    S=S+(-1/3)^n/(2*n+1);
end
Result=sqrt(12)*S
```

Command Window:

```
Enter a value (integer) for m  5
Result =
   3.141308785462883
>>
Enter a value (integer) for m  10
Result =
   3.141593304503081
>>
Enter a value (integer) for m  20
Result =
   3.141592653595635
```

Problem 14

Script File:

```
m=input('Enter a value for m  ');
T=1;
for n=1:m
    nsq=(2*n)^2;
    T=T*nsq/(nsq-1);
end
Piest=2*T
```

Command Window:

```
Enter a value for m  100
Piest =
   3.133787490628158
>>
Enter a value for m  100000
Piest =
   3.141584799657313
>>
Enter a value for m  10000000
Piest =
   3.141592575051505
```

Problem 15

<u>Script File:</u>

```
x=[-3.5 -5 6.2 11 0 8.1 -9 0 3 -1 3 2.5];
n=length(x);
ip=1;
in=1;
for i=1:n
    if x(i)>0
        P(ip)=x(i);
        ip=ip+1;
    elseif x(i)<0
        N(in)=x(i);
        in=in+1;
    end
end
P
N
```

<u>Command Window:</u>

```
P =
    6.2000   11.0000    8.1000    3.0000    3.0000    2.5000
N =
   -3.5000   -5.0000   -9.0000   -1.0000
```

Problem 16

<u>Script File:</u>

```
x=[-3.5 5 -6.2 11.1 0 7 -9.5 2 15 -1 3 2.5];
n=length(x);
for i=1:n-1
    A=x(i);
    for j=i+1:n
        if x(j)<A
            A=x(j);
            x(j)=x(i);
            x(i)=A;
        end
    end
end
x
```

<u>Command Window:</u>

```
x =
   -9.5000   -6.2000   -3.5000   -1.0000        0    2.0000
2.5000    3.0000    5.0000    7.0000   11.1000   15.0000
```

Problem 17

Script File:

```
Es=[73 91 37 81 63 66 50 90 75 43 88 80 79 69 26 82 89 99 71
59];
n=length(Es);
for i=1:8
    A=Es(i);
    for j=i+1:n
        if Es(j)>A
            A=Es(j);
            Es(j)=Es(i);
            Es(i)=A;
        end
    end
end
AveTop8Scores=sum(Es(1:8))/8
```

Command Window:

```
AveTop8Scores =
   87.5000
```

Problem 18

<u>Script File:</u>

```
x=input('Enter a value for an angle in degrees  ');
xr=x*pi/180;
y=0;
for n=1:20
    yn=(-1)^(n-1)*xr^(2*n-1)/factorial(2*n-1);
    yn=y+yn;
    if abs((yn-y)/y)<0.000001
        y=yn;
        break
    end
    y=yn;
end
y
```

<u>Command Window:</u>

```
Enter a value for an angle in degrees  45
y =
   0.707106782936867
Enter a value for an angle in degrees  195
y =
  -0.258819047933546
```

Calculator values:
0.7071067812
-0.2588190451

Problem 19

Script File:

```
S=0;
for i=1:50
    S=S+i;
    if S>=1000
        disp('S is larger than 1000')
        break
    end
    if S>100
        h=floor(S/100);
        t=floor((S-h*100)/10);
        o=S-h*100-t*10;
        if h==t & h==o
            Integer=i
            Sum=S
            break
        end
    end
end
```

Command Window:

```
Integer =
     36
Sum =
   666
```

Problem 20

Script File:

```
clear,
gender=input('Please enter your gender (male, or female)
','s');
AGE=input('Please enter your age (a number)  ');
RHR=input('Please enter your rest hart rate (a number)  ');
FitLevel=input('Please enter your fitness level (low,
medium, or high)   ','s');
switch gender
    case 'male'
        factor=(220-AGE)-RHR;
    case 'female'
        factor=(206-0.88*AGE)-RHR;
end
con=1;
switch FitLevel
    case 'low'
        INTEN=0.55;
    case 'medium'
        INTEN=0.65;
    case 'high'
        INTEN=0.8;
    otherwise
        disp('ERROR: Fitness level was entered incorrectly.')
        con=0;
end
if con==1
THR=factor*INTEN+RHR;
fprintf('Your training heart rate is  %3.0f\n',THR)
end
```

Command Window:

```
Please enter your gender (male, or female)  male
```

```
Please enter your age (a number)  21
Please enter your rest hart rate (a number)  62
Please enter your fitness level (low, medium, or high)
low
Your training heart rate is  137
>>
Please enter your gender (male, or female)  female
Please enter your age (a number)  19
Please enter your rest hart rate (a number)  67
Please enter your fitness level (low, medium, or high)
high
Your training heart rate is  165
```

Problem 21

The equation of the circle can be rewritten as:

$$-2xa - 2yb + a^2 + b^2 - r^2 = -x^2 - y^2$$

Substituting the three points in the equation gives a system of three linear equations for the unknowns: a, b, and $a^2 + b^2 - r^2$. Once the system is solved a and b are known, and r can be determined since $a^2 + b^2 - r^2$ is known.
The problem is solved in the following script file.

```
PA=input('Enter the coordinates of the first point (vector
with two elements) ');
PB=input('Enter the coordinates of the second point (vector
with two elements) ');
PC=input('Enter the coordinates of the second point (vector
with two elements) ');
A=[-2*PA(1) -2*PA(2) 1; -2*PB(1) -2*PB(2) 1; -2*PC(1) -
2*PC(2) 1];
B=[-(PA(1)^2+PA(2)^2); -(PB(1)^2+PB(2)^2); -
(PC(1)^2+PC(2)^2)];
Cb=A\B;
a=Cb(1)
b=Cb(2)
r=sqrt(Cb(1)^2+Cb(2)^2-Cb(3))
th=linspace(0,pi,50);
xp=a+r*cos(th);
ypp=b+r*sin(th);
ypm=b-r*sin(th);
plot(xp,ypp,xp,ypm,PA(1),PA(2),'*',PB(1),PB(2),'*',PC(1),PC(
2),'*')
axis equal
```

Command Window:

```
Enter the coordinates of the first point (vector with
two elements) [13 15]
Enter the coordinates of the second point (vector with
two elements) [4 18]
```
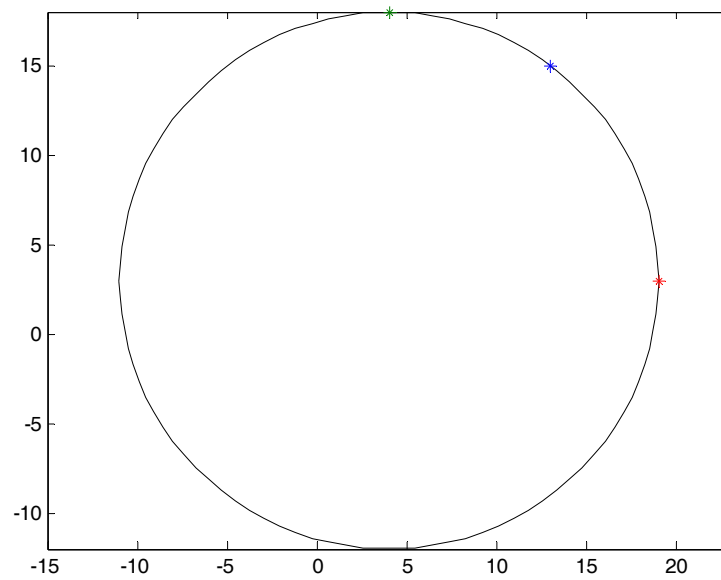
```
Enter the coordinates of the second point (vector with
two elements)  [19 3]
a =
   4.000000000000001
b =
   3.000000000000001
r =
    15
```

Figure:

Problem 22

<u>Script File:</u>

```
w=input('Enter weight in lb ');
h=input('Enter height in inches ');
BMI=703*w/h^2;
BMI=round(BMI*10)/10;
if BMI< 18.5
    fprintf('Your BMI value is %4.1f, which classifies you as
underweight.\n',BMI)
elseif BMI>=18.5 & BMI<25
    fprintf('Your BMI value is %4.1f, which classifies you as
Normal.'\n,BMI)
elseif BMI>=25 & BMI<30
    fprintf('Your BMI value is %4.1f, which classifies you as
Overweight.\n',BMI)
elseif BMI>30
    fprintf('Your BMI value is %4.1f, which classifies you as
OObese.'\n,BMI)
end
```

<u>Command Window:</u>

(*a*)

```
Enter weight in lb 180
Enter height in inches 74
Your BMI value is 23.1, which classifies you as Normal.
```

(*a*)

```
Enter weight in lb 150
Enter height in inches 61
Your BMI value is 28.3, which classifies you as Over-
weight.
```

Problem 23

Script File:

```
t=input('Enter the time the call is made (day, evening, or
night) ','s');
d=input('Enter the duration of the call (in minutes) ');
d=ceil(d);
switch t
    case 'day'
        if d <=10
            cost=d*0.1;
        elseif d<=30 & d>10
            cost=1+(d-10)*0.08;
        else
            cost=2.6+(d-30)*0.06;
        end
    case 'evening'
        if d <=10
            cost=d*0.07;
        elseif d<=30 & d>10
            cost=0.7+(d-10)*0.05;
        else
            cost=1.7+(d-30)*0.04;
        end
    case 'night'
        if d <=10
            cost=d*0.04;
        elseif d<=30 & d>10
            cost=0.4+(d-10)*0.03;
        else
            cost=1+(d-30)*0.02;
        end
end
fprintf('The cost of the call is $%5.2f\n',cost)
```

Command Window:

(*a*)

```
Enter  the  time  the  call  is  made  (day,  evening,  or
night) day
Enter the duration of the call (in minutes) 8.3
The cost of the call is $ 0.90
```

(*b*)

```
Enter  the  time  the  call  is  made  (day,  evening,  or
night) evening
Enter the duration of the call (in minutes) 34.5
The cost of the call is $ 1.90
```

(*c*)
```
Enter  the  time  the  call  is  made  (day,  evening,  or
night) night
Enter the duration of the call (in minutes) 29.6
The cost of the call is $ 1.00
```

Problem 24

Script File:

```
AmToPy=randi(2000)/100;
fprintf('The amount to be paid is:  $%5.2f\n',AmToPy)
Cash=input('Please enter payment in dollars (1, 5, 10 or 20)
');
if Cash<AmToPy
    disp('Insufficient payment')
else
    R=[0 0 0 0 0 0 0];
BilCoin=[1000 500 100 25 10 5 1];
C=round((Cash-AmToPy)*100);
for i=1:7
    if C>=BilCoin(i)
       Nunit=round(floor(C/BilCoin(i)));
       R(i)=Nunit;
       C=C-Nunit*BilCoin(i);
    end
end
disp('The change is:')
fprintf('%2.0f $10 bills\n',R(1))
fprintf('%2.0f $5 bills\n',R(2))
fprintf('%2.0f $1 bills\n',R(3))
fprintf('%2.0f quarters\n',R(4))
fprintf('%2.0f dimes\n',R(5))
fprintf('%2.0f nickels\n',R(6))
fprintf('%2.0f cents\n',R(7))
end
```

Command Window:
Using the program three times:

```
The amount to be paid is:  $ 1.69
Please enter payment in dollars (1, 5, 10 or 20)  20
The change is:
 1 $10 bills
 1 $5 bills
```

```
 3 $1 bills
 1 quarters
 0 dimes
 1 nickels
 1 cents

The amount to be paid is:  $16.01
Please enter payment in dollars (1, 5, 10 or 20)  20
The change is:
 0 $10 bills
 0 $5 bills
 3 $1 bills
 3 quarters
 2 dimes
 0 nickels
 4 cents

The amount to be paid is:  $ 8.63
Please enter payment in dollars (1, 5, 10 or 20)  10
The change is:
 0 $10 bills
 0 $5 bills
 1 $1 bills
 1 quarters
 1 dimes
 0 nickels
 2 cents
```
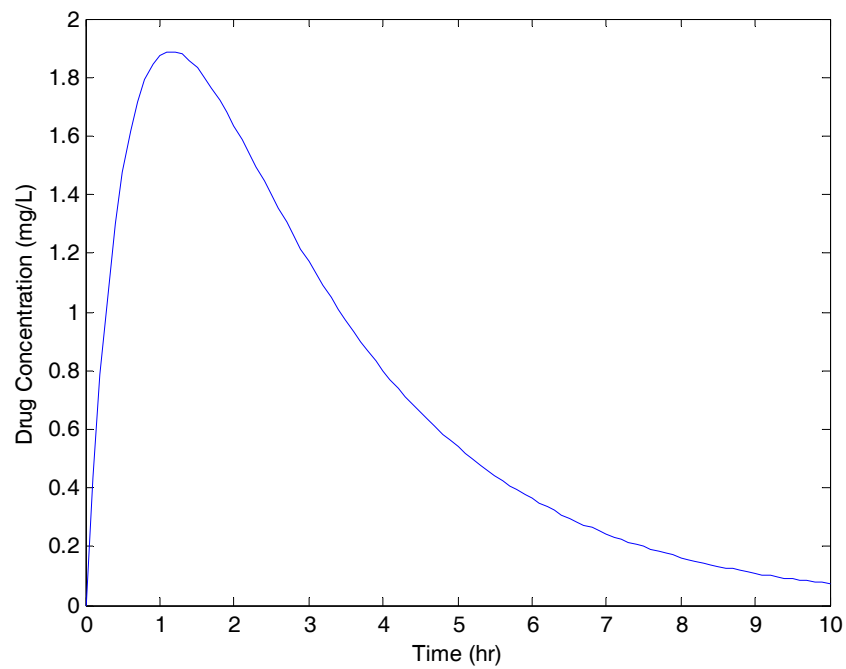
Problem 25

25.a
<u>Script file:</u>

```
clear
t=0:0.1:10;
n=length(t);
DG=150; Vd=50;
C=DG/Vd;
ke=0.4; ka=1.6;
K=ka/(ka-ke);
Con=C*K;
Cp=Con*(exp(-ke*t)-exp(-ka*t));
plot(t,Cp)
xlabel('Time (hr)')
ylabel('Drug Concentration (mg/L)')
```
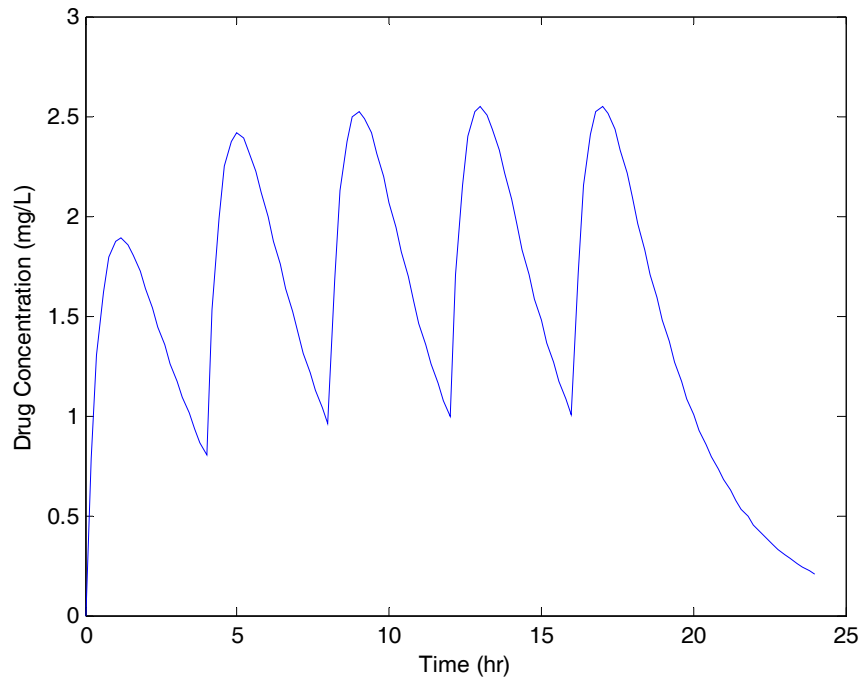
<u>Figure:</u>

25.b
<u>Script file</u>:

```
clear
t=0:0.2:24;
n=length(t);
DG=150; Vd=50;
%C=1.5*100/50;
C=DG/Vd;
ke=0.4; ka=1.6;
K=ka/(ka-ke);
Con=C*K;
for i=1:n
    Cp(i)=Con*(exp(-ke*t(i))-exp(-ka*t(i)));
    if t(i)>4
        Cp(i)=Cp(i)+Con*(exp(-ke*(t(i)-4))-exp(-ka*(t(i)-
4)));
    end
    if t(i)>8
        Cp(i)=Cp(i)+Con*(exp(-ke*(t(i)-8))-exp(-ka*(t(i)-
8)));
    end
    if t(i)>12
        Cp(i)=Cp(i)+Con*(exp(-ke*(t(i)-12))-exp(-ka*(t(i)-
12)));
    end
    if t(i)>16
        Cp(i)=Cp(i)+Con*(exp(-ke*(t(i)-16))-exp(-ka*(t(i)-
16)));
    end
end
plot(t,Cp)
xlabel('Time (hr)')
ylabel('Drug Concentration (mg/L)')
```

Figure:

Problem 26

<u>Script file</u>:

```
P=110
imax=50;
Emax=0.00001;
x=P;
for i=1:imax
    y=(x+P/x)/2;
    E=abs((y-x)/x);
    x=y;
    if E<Emax
        break
    end
end
if E>Emax
    y='ERROR';
    disp('Solution was not obtained in 50 iterations')
end
SquareRootOfP=y
```

<u>Command Window</u>:

26.a

```
P =
   110
SquareRootOfP =
   10.4881
```

26.b

```
P =
      93443
SquareRootOfP =
  305.6845
```

26.c

```
P =
   23.2500
SquareRootOfP =
    4.8218
```

Problem 27

Script file:

```
r=1;
%k=1;c=1;
count=0;
for n=10:500;
%    n
    con=0;
    for i=2:n-1
%        i
%         re=rem(n,i)
        if rem(n,i)==0
          con=1;
          break
        end
    end
%    con
        if con==0
%            count
            if count ==0
                pr1=n;
                count=1;
            elseif n==pr1+2
                pr(r,1)=pr1;
                pr(r,2)=n;
                count=0;
                r=r+1;
            else
                pr1=n;
            end
        end

end
pr
```

Command Window:

```
pr =
    11    13
    17    19
    29    31
    41    43
    59    61
    71    73
   101   103
   107   109
   137   139
   149   151
   179   181
   191   193
   197   199
   227   229
   239   241
   269   271
   281   283
   311   313
   347   349
   419   421
   431   433
   461   463
```

Problem 28

<u>Script file</u>:

```
Vin=input('Enter the value of the volume to be converted:
');
VinUnits=input('Enter the current units (m3, Liter, ft3, or
USGallon):  ','s');
VoutUnits=input('Enter the new units (m3, Liter, ft3, or
USGallon):  ','s');
error=0;
switch VinUnits
case 'm3'
    VL=Vin*1000;
case 'Liter'
    VL=Vin;
case 'ft3'
    VL=Vin*(12*0.254)^3;
case 'USGallon'
    VL=Vin*3.78541178;
otherwise
    error=1;
end
switch VoutUnits
case 'm3'
    Vout=VL/1000;
case 'Liter'
    Vout=VL;
case 'ft3'
    Vout=VL/(12*0.254)^3;
case 'USGallon'
    Vout=VL/3.78541178;
otherwise
    error=1;
end
if error
    disp('ERROR current or new units are typed incorrectly.')
```

```
else
    fprintf('V= %g %s\n',Vout,VoutUnits)
end
```

Command Window:

(*a*)   Convert 3.5 m³ to gal.

```
Enter the value of the volume to be converted: 3.5
Enter the current units (m3, Liter, ft3, or USGallon):
    m3
Enter the new units (m3, Liter, ft3, or USGallon):
    USGallon
V= 924.602 USGallon
```

(*b*)   Convert 200 L to ft³.

```
Enter the value of the volume to be converted: 2000
Enter the current units (m3, Liter, ft3, or USGallon):
    Liter
Enter the new units (m3, Liter, ft3, or USGallon):  ft3
V= 70.6293 ft3
```

(*c*)   Convert 480 ft³ to m³.

```
Enter the value of the volume to be converted: 480
Enter the current units (m3, Liter, ft3, or USGallon):
    ft3
Enter the new units (m3, Liter, ft3, or USGallon):  m3
V= 13.5921 m3
```

Problem 29

Script file:

```matlab
for j=1:100
x=0;
  for i=1:1000
      x=x+randn(1,1);
      if abs(x)>10
          break
      end
  end
  if i==1000
      disp('ERROR: Boundary was not reached in 1000 steps')
  end
  steps(j)=i;
end
AveNumSteps=mean(steps)
```

Command Window:

```
AveNumSteps =
  104.3300
```

Problem 30

<u>Script file</u>:

```
x(1)=0;  y(1)=0;
for i=2:10
  n=randi(3);
  if n==1
      x(i)=0.5*x(i-1);
      y(i)=0.5*y(i-1);
  elseif n==2
      x(i)=0.5*x(i-1)+0.25;
      y(i)=0.5*y(i-1)+sqrt(3)/4;
  elseif n==3
      x(i)=0.5*x(i-1)+0.5;
      y(i)=0.5*y(i-1);
  end
end
  plot(x,y,'^')
```
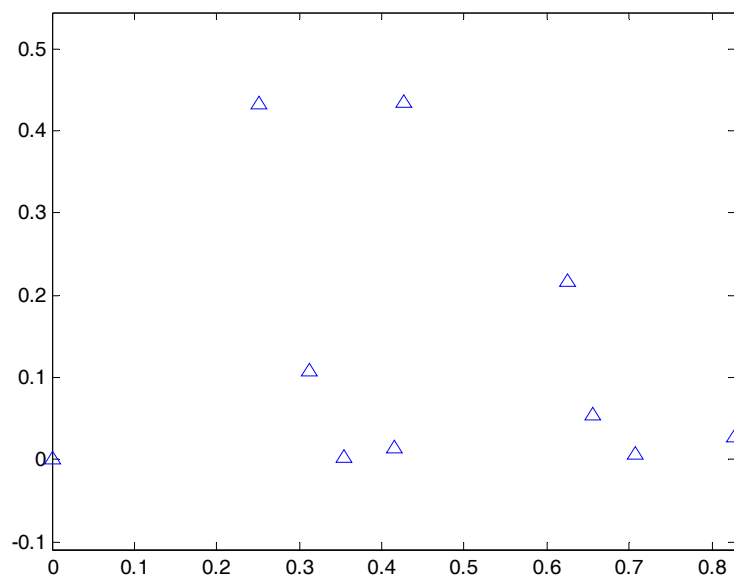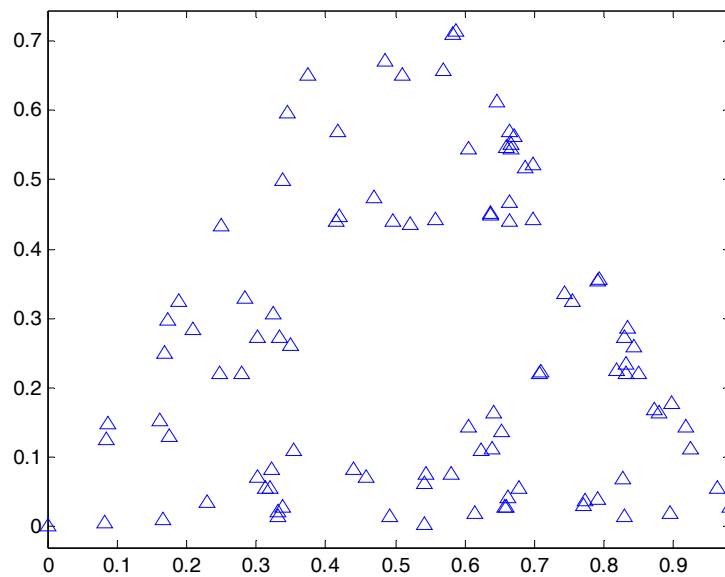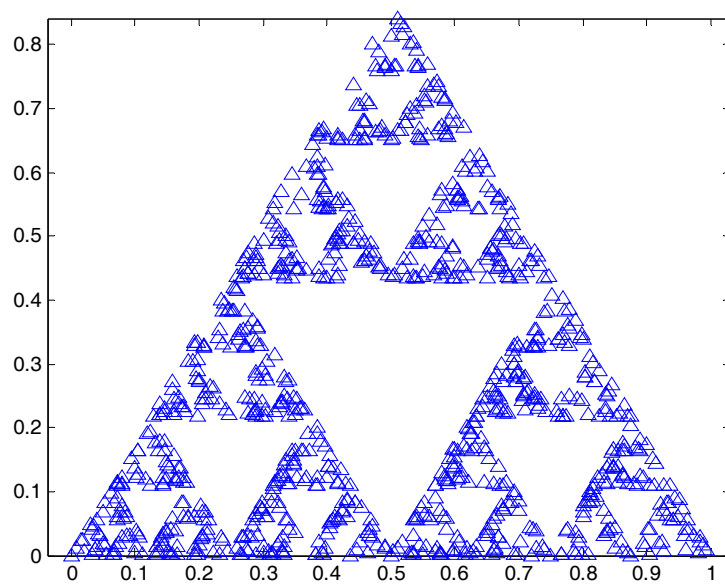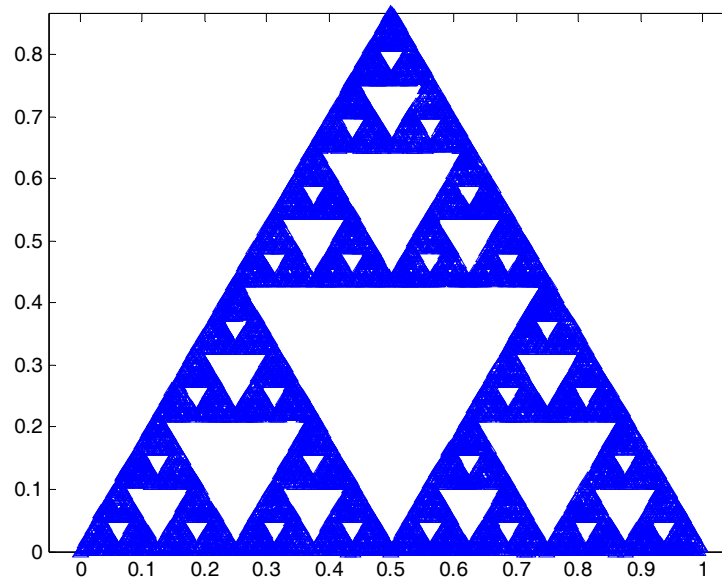
Figure when $n = 10$

Figure when $n = 100$

Figure when $n = 1000$

Figure when $n = 1000$

Problem 31

<u>Script file</u>:

```
teams=1:12;
for i= 1:6
    for j=1:2
        n=length(teams);
        N=randi(n);
        Table(i,j)=teams(N);
        teams(N)=[];
    end
end
disp(Table)
```

<u>Command Window</u>:

```
     5     11
     4      2
    10      6
     3      8
     1      7
    12      9
```

Problem 32

<u>Script file</u>:

```matlab
disp('Heat Capacity for SO2, SO3, O2, and N2 at various tem-
peratures')
Gas=input('Enter the gas name from the list abobe ','s');
switch Gas
    case 'SO2'
        a=38.91; b=3.904E-2; c=-3.105E-5; d=8.606E-9;
    case 'SO3'
        a=48.50; b=9.188E-2; c=-8.54E-5; d=32.4E-9;
    case 'O2'
        a=29.10; b=1.158E-2; c=-0.6076E-5; d=1.311E-9;
    case 'N2'
        a=29.00; b=0.2199E-2; c=-0.5723E-5; d=-2.871E-9;
end
c=1;
i=1;
while c==1
T(i)=input('Enter temperature ');
q=input('Additional temperature? (Enter yes or no) ','s');
switch q
    case 'yes'
    i=i+1;
    case 'no'
    c=0;
end
end
Cp=a+b*T+c*T.^2+d*T.^3;
Table=[T' Cp'];
fprintf('Heat capacity of %s\n',Gas)
disp('    T (C)  Cp (J/(g mol)(C))')
disp(Table)
```

<u>Command Window:</u>

(*a*)

```
Heat Capacity for SO2, SO3, O2, and N2 at various tem-
peratures
Enter the gas name from the list abobe SO3
Enter temperature (C) 100
Additional temperature? (Enter yes or no) yes
Enter temperature (C) 180
Additional temperature? (Enter yes or no) no

Heat capacity of SO3

   T (C)      Cp (J/(g mol)(C))
  100.0000    57.7204
  180.0000    65.2274
```

(*b*)

```
Heat Capacity for SO2, SO3, O2, and N2 at various tem-
peratures
Enter the gas name from the list abobe N2
Enter temperature (C) 220
Additional temperature? (Enter yes or no) yes
Enter temperature (C) 300
Additional temperature? (Enter yes or no) no

Heat capacity of N2

   T (C)      Cp (J/(g mol)(C))
  220.0000    29.4532
  300.0000    29.5822
```

Problem 33

<u>Script file</u>:

```
q=input('Enter five quiz grades (0-10) in a vector ');
m=input('Enter three midterm grades (0-100) in a vector ');
f=input('Enter the final grade (0-100) ');
[qmin,iq]=min(q);
q(iq)=[];
qav=mean(q);
mav=mean(m);
if f > mav
    [mmin,im]=min(m);
    m(im)=[];
    mav=mean(m);
end
grade=qav/10*25+mav/100*35+f/100*40;
if grade >= 90
    disp('The course grade is A')
elseif grade < 90 & grade >= 80
    disp('The course grade is B')
elseif grade < 80 & grade >= 70
    disp('The course grade is C')
elseif grade < 70 & grade >= 60
    disp('The course grade is D')
else
    disp('The course grade is E')
end
```

<u>Command Window</u>:

(*a*)

```
Enter five quiz grades (0-10) in a vector [7 9 4 8 7]
Enter three midterm grades (0-100) in a vector [93 83
87]
Enter the final grade (0-100) 89
The course grade is B
```

(*b*)

```
Enter five quiz grades (0-10) in a vector [8 6 9 6 9]
Enter three midterm grades (0-100) in a vector [81 75
79]
Enter the final grade (0-100) 72
The course grade is C
```

Problem 34

<u>Script file</u>:

```
clear
clc
disp('A golfer''s record is recorded in a three columns
matrix, ')
disp('where the first column is the course rating, the sec-
ond is the ')
disp('course slope, and the third is the players score')
gr=input('Enter golfer''s record ');
[r c]=size(gr);
if r > 20
    gr(21:r,:)=[];
end
hcd=(gr(:,3)-gr(:,1))./gr(:,2)*113;
if r < 5
    N=0;
elseif r==5 | r == 6
    N=1;
elseif r==7 | r == 8
    N=2;
elseif r==9 | r == 10
    N=3;
elseif r==11 | r == 12
    N=4;
elseif r==13 | r == 14
    N=5;
elseif r==15 | r == 16
    N=6;
elseif r==17
    N=7;
elseif r==18
    N=8;
elseif r==19
    N=9;
```

```
elseif r>=20
    N=10;
end
if N==0
    disp('A handicap cannot be computed for fewer than five
rounds')
else
hcdSort=sort(hcd)';
HCD=mean(hcdSort(r+1-N:r));
HCD=floor(HCD*10)/10;
fprintf('The golfer handicap is %4.1f\n',HCD)
end
```

Command Window:

(*a*)

```
A golfer's record is recorded in a three columns
matrix,
where the first column is the course rating, the second
is the
course slope, and the third is the players score
Enter golfer's record [71.6 122 85; 72.8 118 87; 69.7
103 83; 70.3 115 81; 70.9 116 79; 72.3 117 91
71.6 122 89; 70.3 115 83; 72.8 118 92; 70.9 109 80;
73.1 132 94; 68.2 115 78
74.2 135 103; 71.9 121 84]
The golfer handicap is 18.9
```

(*b*)

```
A golfer's record is recorded in a three columns
matrix,
where the first column is the course rating, the second
is the
course slope, and the third is the players score
Enter golfer's record [72.2 119 71; 71.6 122 73; 74 139
78; 68.2 125 69
70.2 130 74; 69.6 109 69; 66.6 111 74]
The golfer handicap is  5.4
```