Chapter 1
Solved Problems

Problem 1

```
>> % Part a
>> (14.8^2+6.5^2)/3.8^2+55/(sqrt(2)+14)
ans =
   21.6630
>> % Part b
>> (-3.5)^3+exp(6)/log(524)+206^(1/3)
ans =
   27.4611
```

Problem 2

```
>> % Part a
>> 16.5^2*(8.4-sqrt(70))/(4.3^2-17.3)
ans =
    7.6412
>> % Part b
>> (5.2^3-6.4^2+3)/(1.6^8-2)+(13.3/5)^1.5
ans =
    6.8450
```

Problem 3

```
>> % Part a
>> 15*((sqrt(10)+3.7^2)/(log10(1365)+1.9))
ans =
   50.2041
>> % Part b
>> 2.5^3*(16-216/22)/(1.7^4+14)+2050^(1/4)
ans =
   11.0501
```

Problem 4

```
>> % Part a
>> 2.3^2*1.7/sqrt((1-0.8^2)^2+(2-sqrt(0.87))^2)
ans =
    7.9842
>> % Part b
>> 2.34+0.5*2.7*(5.9^2-2.4^2)+9.8*log(51)
ans =
   80.0894
```

Problem 5

```
>> % Part a
>> sin(7*pi/9)/cos(5*pi/7)^2+tan(5*pi/12)/7
ans =
    2.1867
>> % Part b
>>  tand(64)/cosd(14)^2-3*sind(80)/0.9^(1/3)+cosd(55)/
sind(11)
ans =
    2.1238
```

Problem 6

```
>> x=2.34;
>> % Part a
>> 2*x^4-6*x^3+14.8*x^2+9.1
ans =
   73.2258
>> % Part b
>> exp(2*x)/sqrt(14+x^2-x)
ans =
   26.0345
```

Problem 7

```
>> t=6.8;
>> % Part a
>> log(abs(t^2-t^3))
ans =
    5.5917
>> % Part b
>> 75/(2*t)*cos(0.8*t-3)
ans =
   -4.2122
```

Problem 8

```
>> x=8.3; y=2.4;
>> % Part a
>> x^2+y^2-x^2/y^2
ans =
   62.6899
>> % Part b
>> sqrt(x*y)-sqrt(x+y)+((x-y)/(x-2*y))^2-sqrt(x/y)
ans =
    2.1741
```

Problem 9

Script file:

```
a=13; b=4.2;
c=4*b/a;
d=a*b*c/(a+b+c);
% Part a
disp('Part a')
Pa=a*b/(c+d)+d*a/(c*d)-(a-b^2)*(c+d)
% Part b
disp('Part b')
Pb=sqrt(a^2+b^2)/(d-c)+log(abs(b-a+c-d)))
```

Command Window:

```
Part a
Pa =
   44.4496
Part b
Pb =
    7.8410
```

Problem 10

Script file:

```
a=18;
Sc=6*a^2;
disp('Part a')
ra=sqrt(Sc/(4*pi))
Vc=a^3;
disp('Part b')
rb=(Vc*3/(4*pi))^(1/3)
```

Command Window

```
Part a
ra =
   12.4378
Part b
rb =
   11.1663
```

Problem 11

Script file

```
% Part a
a=9; b=3;
disp('Part a')
P=2*pi*sqrt((a^2+b^2)/2)
% Part b
Pb=20;
ab=sqrt(2/5)*Pb/(2*pi)
bb=2*ab
```

Command Window

```
Part a
P =
   42.1489
Part b
ab =
    2.0132
bb =
    4.0263
```

Problem 12

Script file

```
x=pi/9;
% Part a
disp('Part a')
Lhsa=sin(4*x)
Rhsa=4*sin(x)*cos(x)-8*sin(x)^3*cos(x)
% Part b
disp('Part b')
Lhsb=cos(2*x)
Rhsb=(1-tan(x)^2)/(1+tan(x)^2)
```

Command Window

```
Part a
Lhsa =
    0.9848
Rhsa =
    0.9848
Part b
Lhsb =
    0.7660
Rhsb =
    0.7660
```

Problem 13

Script file

```
x=12;
% Part a
disp('Part a')
Lhsa=tand(4*x)
Rhsa=(4*tand(x)-4*tand(x)^3)/(1-6*tand(x)^2+tand(x)^4)
% Part b
disp('Part b')
Lhsb=sind(x)^3
Rhsb=(3*sind(x)-sind(3*x))/4
```

Command Window

```
Part a
Lhsa =
    1.1106
Rhsa =
    1.1106
Part b
Lhsb =
    0.0090
Rhsb =
    0.0090
```

Problem 14

Script file

```
al=5*pi/8; bet=pi/8;
Lhsa=sin(al)*cos(bet)
Rhsa=(sin(al-bet)+sin(al+bet))/2
```

Command Window

```
Lhsa =
    0.8536
Rhsa =
    0.8536
```

Problem 15

Script file

```
a=pi/9; b=3*pi/5;
A=a/2+sin(a)/2;
B=b/2+sin(b)/2;
I=B-A
```

Command Window

```
I =
    1.0725
```

Problem 16

Script file

```
a=9; b=18; c=25;
alpha=acosd((b^2+c^2-a^2)/(2*b*c))
bet=asind(sind(alpha)*b/a)
gam=asind(sind(alpha)*c/a)
gam=180-gam
alpha+bet+gam
```

Command Window

```
alpha =
   15.3245
bet =
   31.9090
gam =
   47.2335
gam =
  132.7665
ans =
   1804
```

Problem 17

Script file

```
clear, clc
a=5; b=7; gam=25;
disp('Part a')
c=sqrt(a^2+b^2-2*a*b*cosd(gam))
disp('Part b')
alpha=asind(a*sind(gam)/c)
bet=asind(b*sind(gam)/c)
bet=180-bet
disp('Part c')
```

```
Lhs=(a-b)/(a+b)
Rhs=tand((alpha-bet)/2)/tand((alpha+bet)/2)
```

Command Window

```
Part a
c =
    3.2494
Part b
alpha =
   40.5647
bet =
   65.5647
bet =
  114.4353
Part c
Lhs =
   -0.1667
Rhs =
   -0.1667
```

Problem 18

Script file

```
a=200; b=250; c=300;
disp('Part a')
gam=acosd((a^2+b^2-c^2)/(2*a*b))
disp('Part b')
rb=0.5*(a+b-c)*tand(gam/2)
disp('Part c')
s=(a+b+c)/2;
rc=sqrt(s*(s-a)*(s-b)*(s-c))/s
```

Command Window

```
Part a
gam =
```

```
   82.8192
Part b
rb =
   66.1438
Part c
rc =
   66.1438
```

Problem 19

Script file

```
a=16; c=50;
disp('Part a')
b=sqrt(c^2-a^2)
disp('Part b')
alpha=acosd(b/c)
```

Command Window

```
Part a
b =
   47.3709
Part b
alpha =
   18.6629
```

Problem 20

Script file

```
A=2; B=23; C=13; D=-24;
x0=8; y0=3; z0=-10;
t=abs(A*x0+B*y0+C*z0+D);
b=sqrt(A^2+B^2+C^2);
d=t/b
```

Command Window

```
d =
    2.6042
```

Problem 21

Script file

```
a=12; b=8;
A=sqrt(b^2+16*a^2)/2;
B=b^2*log((4*a+sqrt(b^2+16*a^2))/b)/(8*a);
s=A+B
```

Command Window

```
s =
   25.9922
```

Problem 22

Command Window

```
>> boxes=ceil(4000/52)
boxes =
    77
```

Problem 23

Script file

```
R1=120; R2=100; R3=220; R4=120;
V=12;
Vab=V*(R2/(R1+R2)-R4/(R3+R4))
```

Command Window

```
Vab =
    1.2193
```

Problem 24

Script file

```
format bank
oak=54.95; pine=39.95;
a=16*oak+20*pine
b=a*1.0625
c=round(b)
```

Command Window

```
a =
        1678.20
b =
        1783.09
c =
        1783.00
```

Problem 25

Script file

```
L=0.2; R1=1500; R2=1500; C=2e-6;
f=sqrt(L*C*(R1^2*C-L)/(R2^2*C-L))/(2*pi)
```

Command Window

```
f =
  1.0066e-004
```

Problem 26

Command Window

```
>> factorial(52)/(factorial(5)*factorial(52-5))
ans =
     2598960
```

Problem 27

Command Window
(*a*)

```
>> log(0.085)/log(4)
ans =
   -1.7782
```

(*b*)

```
>> log(1500)/log(6)
ans =
    4.0816
```

Problem 28

Command Window

```
>> I=120*(1-exp(-240*0.003/0.5))/240
I =
    0.3815
>>
```

Problem 29

Script file

```
k=log(0.5)/5730;
t=round(log(0.788)/k)
```

Command Window

```
t =
        1970
```

Problem 30

Command Window

```
>> lcm(6,26)
ans =
    78
>> lcm(6,34)
ans =
   102
```

Problem 31

Script file

```
MI=10^((8.5+10.7)*3/2);
MC=10^((7.9+10.7)*3/2);
r=MI/MC
```

Command Window

```
r =
   7.943282347242723
```

Problem 32

Script file

```
L=2; c=300E6; v=5000;
del=L*(1-sqrt(1-v^2/c^2))
```

Command Window

```
del =
    2.777778007612142e-010
```

Problem 33

Script file

```
format bank
P=85000; r=0.0575; y=15;
disp('Part a')
M=P*(r/12)/(1-(1+r/12)^(-12*y))
disp('Part b')
T=M*12*15c
```

Command Window

```
Part a
M =
         705.85
Part b
T =
     127052.74a
```

Problem 34

Script file

```
P=40000; r=0.055; ta=20;
Ba=P*(1+r)^ta;
tb=log(Ba/P)/r;
days=(ta-tb)*365
```

Command Window

```
days =
         193.68
```

Problem 35

Script file

```
A=16.0137; B=3096.52; C=-53.67;
p315=exp(A-B/(C+315))
p405=exp(A-B/(C+405))
```

Command Window

```
p315 =
   64.3682
p405 =
  1.3394e+003
```

Problem 36

Script file

```
p0=20E-6;
% Part a
disp('Part a')
pa=80E-2;
Lp=20*log10(pa/p0)
% Part b
disp('Part b')
Lpb=110;
pb=p0*10^(Lpb/20);
m=pb/pa
```

Command Window

```
Part a
Lp =
   92.0412
Part b
m =
    7.9057
```

Problem 37

Command Window

```
>> format rat
>> 5/8+16/6
ans =
      79/24
>> 1/3-11/13+2.7^2
ans =
    1247/184
```

Problem 38

Script file

```
L=3; k=401; r2=0.05; r1=0.03; T2=20; T1=100;
q=2*pi*L*k*(T1-T2)/log(r2/r1)
```

Command Window

```
q =
  1.1838e+006
```

Problem 39

Script file

```
n=20;
nfS=sqrt(2*pi*n)*(n/exp(1))^n
nf=factorial(n)
Error=(nf-nfS)/nf
```

Command Window

```
nfS =
  2.4228e+018
nf =
  2.4329e+018
```

```
Error =
    0.0042
```

Problem 40

Script file

```
V=600; th=54; g=32.2;
t=2*V*sind(54)/g
xmax=2*V^2*sind(th)*cosd(th)/g
hmax=2*V^2*sind(th)^2/g
```

Command Window

```
t =
   30.1497
xmax =
  1.0633e+004
hmax =
  1.4635e+004
```