

Chapter 1

Solved Problems

Problem 1

Script file:

```
clear, clc
disp('Part (a)')
(22+5.1^2)/(50-6.3^2)
disp('Part (b)')
44/7+8^2/5-99/3.9^2
```

Command Window:

```
Part (a)
ans =
4.6566
Part (b)
ans =
12.5768
```

Problem 3

Script file:

```
clear, clc
disp('Part (a)')
(14.8^3-6.3^2)/(sqrt(13)+5)^2
disp('Part (b)')
45*(288/9.3-4.6^2)-1065*exp(-1.5)
```

Command Window:

```
Part (a)
ans =
43.2392
Part (b)
ans =
203.7148
```

Problem 5

Script file:

```
clear, clc
disp('Part (a)')
%alternative: sin(15*pi/180) instead of sind(15)
cos(7*pi/9)+tan(7*pi/15)*sind(15)
disp('Part (b)')
%alternatives: could use nthroot(0.18,3), could convert to radians
%and use regular trig functions
sind(80)^2-(cosd(14)*sind(80))^2/(0.18)^(1/3)
```

Command Window:

```
Part (a)
ans =
1.6965
Part (b)
ans =
-0.6473
```

Problem 7

Script file:

```
clear, clc
t=3.2;
disp('Part (a)')
56*t-9.81*t^2/2
disp('Part (b)')
14*exp(-0.1*t)*sin(2*pi*t)
```

Command Window:

```
Part (a)
ans =
128.9728
Part (b)
ans =
9.6685
```

Problem 9

Script file:

```
clear, clc
a=12; b=5.6; c=3*a/b^2; d=(a-b)^c/c;
disp('Part (a)')
a/b+(d-c)/(d+c)-(d-b)^2
disp('Part (b)')
exp((d-c)/(a-2*b))+log(abs(c-d+b/a))
```

Command Window:

```
Part (a)
ans =
-0.1459
Part (b)
ans =
2.2925e+03
```

Problem 11

Script file:

```
clear, clc
a=11; b=9;
%could be one long expression
s=sqrt(b^2+16*a^2);
Labc = s/2 + b^2/(8*a)*log((4*a+s)/b)
```

Command Window:

```
Labc =
24.5637
```

Problem 13

Script file:

```
clear, clc
x=24;
disp('Part (a)')
%compare LHS and RHS
LHS = tand(3*x)
RHS = (3*tand(x)-tand(x)^3)/(1-3*tand(x)^2)
disp('Part (b)')
LHS = cosd(4*x)
RHS = 8*(cosd(x)^4-cosd(x)^2)+1
```

Command Window:

```
Part (a)
LHS =
3.0777
RHS =
3.0777
Part (b)
LHS =
-0.1045
RHS =
-0.1045
```

Problem 15

Script file:

```
clear, clc
Integral=sin(a*3*pi/2)/a^2 - 3*pi/2*cos(a*3*pi/2)/a - ...
```

$\sin(a\pi/3)/a^2 + \pi/3\cos(a\pi/3)/a$

Command Window:

Integral =
8.1072

Problem 17

Script file:

```
clear, clc
a=5; b=7; gamma=25;
disp('Part (a)')
c=sqrt(a^2+b^2-2*a*b*cosd(gamma))
disp('Part (b)')
alpha = asind(a*sind(gamma)/c)
%note that beta is over 90 deg and asind will give 1st quadrant
beta = 180 - asind(b*sind(gamma)/c)
disp('Part (c)')
%compare LHS with RHS
LHS=(a-b)/(a+b)
RHS=tand((alpha-beta)/2)/tand((alpha+beta)/2)
```

Command Window:

Part (a)
c =
3.2494
Part (b)
alpha =
40.5647
beta =
114.4353
Part (c)
LHS =
-0.1667
RHS =
-0.1667

Problem 19

Script file:

```
clear, clc
x=48; b=34; gamma=83;
disp('Part (a)')
c=sqrt(a^2+b^2-2*a*b*cosd(gamma))
disp('Part (b)')
s=(a+b+c)/2;
r=a*b*c/(4*sqrt(s*(s-a)*(s-b)*(s-c)))
```

Command Window:

Part (a)
c =
33.7574
Part (b)
r =
17.0055

Problem 21

Script file:

```
clear, clc
a=16; b=11;
C=pi*(3*(a+b)-sqrt((3*a+b)*(a+3*b)))
```

Command Window:

C =
85.5518

Problem 23

Script file:

```
clear, clc
%alternate rem(739,54)
unpacked=739-54*fix(739/54)
```

Command Window:

```
unpacked =
37
```

Problem 25

Script file:

```
clear, clc
V=14; R1=120.6; R2=119.3; R3=121.2; R4=118.8;
Vab=V*(R1*R3-R2*R4)/(R1+R3)*(R3+R4)
```

Command Window:

```
Vab =
0.1071
```

Problem 27

Script file:

```
clear, clc
L=0.15; R=14; C=2.6e-6;
disp('Part (a)')
number_combinations=factorial(49)/(factorial(6)*factorial(49-6))
disp('Part (b)')
chance_of_2=factorial(6)/(factorial(2)*factorial(6-2))* ...
factorial(43)/(factorial(4)*factorial(43-4))/ ...
(factorial(49)/(factorial(6)*factorial(49-6)))
```

Command Window:

```
Part (a)
number_combinations =
13983816
Part (b)
chance_of_2 =
0.1324
```

Problem 29

Script file:

```
clear, clc
R1=120; R2=220; R3=75; R4=130;
Req=1/(1/R1+1/R2+1/R3+1/R4)
```

Command Window:

```
Req =
29.4947
```

Problem 31

Script file:

```
clear, clc
k=log(0.5)/5730;
Age=round(log(.7745)/k)
```

Command Window:

```
Age =
2112
```

Problem 33

Script file:

```
clear, clc
ratio=10^(3*(9.5+10.7)/2)/10^(3*(8.7+10.7)/2)
```

Command Window:

```
ratio =
15.8489
```

Problem 35

Script file:

```
clear, clc
format bank
%an interest rate of 10% is assumed
P=80000; n=5; r=.1;
bonus=P*(1+ r/365)^(365*n) - P*(1+ r)^n
```

Command Window:

```
bonus =
3047.87
```

Problem 37

Script file:

```
clear, clc
sigma=12000; h=5; b=4; a=1.5;
K=sigma*sqrt(pi*a)*(1-a/(2*b)+0.326*(a/b)^2)/sqrt(1-a/b)
```

Command Window:

```
K =
2.8283e+04
```

Problem 39

Script file:

```
clear, clc
format rat
disp('Part (a)')
5/8+16/6
disp('Part (b)')
1/3-11/13+2.7^2
```

Command Window:

```
Part (a)
ans =
79/24
Part (b)
ans =
1247/184
```