Student Info

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Problems & Solutions

1.1 (A)

Answer:

```
46.5000
```

Code:

```
a=2;
b=4;
c=8;
x=3.5;
y=a*x^2+b*x+c;
y
```

1.1 (B)

Answer:

```
1.3304e-06
```

Script:

```
p0 = 1.6;
c = 4;
x = 3.5;
p = p0 * exp(-c*x);
p
```

1.1 (C)

Answer:

```
2.0602
```

Script:

```
h = 4;
theta = 31;
z = h * sin(theta/180 * pi);
z
```

1.1 (D)

Answer:

```
296.7580
```

Script:

```
h = 6.9;
r = 3.7;
v = pi * h * r ^2;
v
```

1.2

Answer:

```
    31
    28
    31
    30
    31
    30
    31
    31
    30
    31
    30
    31

    31
    29
    31
```

```
    30
    31
    30
    31
    31
    30
    31
    30
    31


C =

    31    31
    28    29
    31    31
    30    30
    31    31
    30    30
    31    31
    31    31
    30    30
    31    31
    30    30
    31    31
```

Script:

```
a = [31;28;31;30;31;30;31;31;30;31;30;31];
b = [31;29;31;30;31;30;31;31;30;31;30;31];
C = [a b];
disp(a);
disp(b);
C
```

1.3

Answer:

```
x =

    11
    10
     8
     5
```

Script:

```
y = [1;2;3;5];
M = [1 -1 0 0; 0 1 -1 0; 0 0 1 -1; 0 0 0 1];
x = M\y;
x
```

1.4

Answer:

```
M =

  Columns 1 through 9

     1    -1     0     0     0     0     0     0     0
     0     1    -1     0     0     0     0     0     0
     0     0     1    -1     0     0     0     0     0
     0     0     0     1    -1     0     0     0     0
     0     0     0     0     1    -1     0     0     0
     0     0     0     0     0     1    -1     0     0
     0     0     0     0     0     0     1    -1     0
     0     0     0     0     0     0     0     1    -1
```

0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

```
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0

Columns 10 through 18

     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
    -1     0     0     0     0     0     0     0     0
     1    -1     0     0     0     0     0     0     0
     0     1    -1     0     0     0     0     0     0
     0     0     1    -1     0     0     0     0     0
     0     0     0     1    -1     0     0     0     0
     0     0     0     0     1    -1     0     0     0
     0     0     0     0     0     1    -1     0     0
     0     0     0     0     0     0     1    -1     0
     0     0     0     0     0     0     0     1    -1
     0     0     0     0     0     0     0     0     1
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
```

```
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0

  Columns 19 through 27

     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
```

```
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
-1  0  0  0  0  0  0  0  0
 1 -1  0  0  0  0  0  0  0
 0  1 -1  0  0  0  0  0  0
 0  0  1 -1  0  0  0  0  0
 0  0  0  1 -1  0  0  0  0
 0  0  0  0  1 -1  0  0  0
 0  0  0  0  0  1 -1  0  0
 0  0  0  0  0  0  1 -1  0
 0  0  0  0  0  0  0  1 -1
 0  0  0  0  0  0  0  0  1
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0
```

```
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0

  Columns 28 through 36

     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
```

```
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
    -1     0     0     0     0     0     0     0     0
     1    -1     0     0     0     0     0     0     0
     0     1    -1     0     0     0     0     0     0
     0     0     1    -1     0     0     0     0     0
     0     0     0     1    -1     0     0     0     0
     0     0     0     0     1    -1     0     0     0
     0     0     0     0     0     1    -1     0     0
     0     0     0     0     0     0     1    -1     0
     0     0     0     0     0     0     0     1    -1
     0     0     0     0     0     0     0     0     1
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0

Columns 37 through 45

     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
```

0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
−1	0	0	0	0	0	0	0	0
1	−1	0	0	0	0	0	0	0
0	1	−1	0	0	0	0	0	0
0	0	1	−1	0	0	0	0	0
0	0	0	1	−1	0	0	0	0
0	0	0	0	1	−1	0	0	0

```
     0     0     0     0     0     1    -1     0     0
     0     0     0     0     0     0     1    -1     0
     0     0     0     0     0     0     0     1    -1
     0     0     0     0     0     0     0     0     1
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0

  Columns 46 through 50

     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     0
```

```
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
-1  0  0  0  0
 1 -1  0  0  0
 0  1 -1  0  0
 0  0  1 -1  0
 0  0  0  1 -1
 0  0  0  0  1
```

Script:

```
n = 50;
l = [1 -1 zeros(1,n-2)];
ll = [1 zeros(1,n-1)];
M = toeplitz(ll,l);
M
```

1.5

Answer:

```
allPositive =

  logical

   1
```

None of the Neuse River discharge data is negative.

Script:

```
D=load('neuse.txt');
t=D(:,1);
d=D(:,2);
allPositive = true;
for i = 1:length(d)

    if d(i) < 0
        allPositive = false;
    end

end
allPositive
```