

Solution to Exercises Chapter 3

3.1

```
ft = input('Enter the value of length in feet: ');
disp([num2str(ft) ' ft = ' num2str(ft*0.3048) ' m'])
```

Answer: Enter the value of length in feet: 11.4
11.4 ft = 3.4747 m

3.2

```
acre = input('Enter the number of acres: ');
disp([num2str(acre) ' acres = ' num2str(acre*43560*0.092903) ' sq. m'])
```

Answer: Enter the number of acres: 2.4
2.4 acres = 9712.4512 sq. m

3.3

```
Decimal = input('Enter a positive integer < 4.5x10^15: ');
disp(['The binary representation of ' num2str(Decimal) ' is ' num2str(dec2bin(Decimal))])
```

Answer: Enter a positive integer < 4.5x10¹⁵: 37
The binary representation of 37 is 100101

3.4

```
R = input('Enter the real part of a complex number: ');
I = input('Enter the imaginary part of a complex number: ');
z = complex(R,I);
disp(['The magnitude and phase of ' num2str(z) ' is'])
disp(['Magnitude = ' num2str(abs(z)) ' Phase angle = ' num2str(angle(z)*180/pi) ' degrees'])
```

Answer: Enter the real part of a complex number: -7
Enter the imaginary part of a complex number: 13
The magnitude and phase of -7+13i is
Magnitude = 14.7648 Phase angle = 118.3008 degrees

3.5

```
n = 0:15;
f = (((1+sqrt(5))/2).^n-((1-sqrt(5))/2).^n)/sqrt(5);
disp([repmat('F', length(n),1) num2str(n',2) repmat(' = ', length(n),1) num2str(f')])
% or
fprintf(1, 'F%2.0f = %3.0f\n', [n;f])
```

Answers: F 0 = 0
F 1 = 1
F 2 = 1
F 3 = 2
...
F15 = 610

3.6

```

n = 9:-1:2; L = length(n);
A = [repmat('cos(pi/', L, 1) int2str(n) repmat(') = ', L, 1) num2str(cos(pi./n), '%1.5f')]
B = [repmat(' pi/', L, 1) int2str(n) repmat(') = ', L, 1) num2str(180./n, '%2.1f') repmat(' degrees', L, 1)]
disp([A B])
fprintf(1, 'cos(pi/%1.0f) = %1.5f pi/%1.0f = %2.1f degrees\n', [n; cos(pi./n); n; 180./n])

```

Answer: cos(pi/9) = 0.93969 pi/9 = 20.0 degrees
cos(pi/8) = 0.92388 pi/8 = 22.5 degrees
cos(pi/7) = 0.90097 pi/7 = 25.7 degrees
cos(pi/6) = 0.86603 pi/6 = 30.0 degrees
cos(pi/5) = 0.80902 pi/5 = 36.0 degrees
cos(pi/4) = 0.70711 pi/4 = 45.0 degrees
cos(pi/3) = 0.50000 pi/3 = 60.0 degrees
cos(pi/2) = 0.00000 pi/2 = 90.0 degrees

3.7

```

Mon = {'January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', ...
       'September', 'October', 'November', 'December'};
Srt = char(sort(Mon));
disp([Srt(1:6,:) repmat(' ', 6, 1) Srt(7:12,:)])

```

Answer: April June
August March
December May
February November
January October
July September

3.8

```

N = input('Enter an integer < 12: ');
n = 1:N;
disp(' ')
disp([repmat('For n = ', N, 1) int2str(n) repmat(', ', N, 1) int2str(n) repmat('! = ', N, 1) int2str(factorial(n))])
disp(' ')
disp(['The sum of these ' int2str(N) ' factorials = ' int2str(sum(factorial(n)))])

```

Answer: Enter an integer < 12: 4

For n = 1, 1! = 1
For n = 2, 2! = 2
For n = 3, 3! = 6
For n = 4, 4! = 24

The sum of these 4 factorials = 33