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Q.1

```
a=1.2; b=2.3; c=4.5; d=4;
answer = a.^3 + sqrt(b.*d) - 4*c;
disp(answer)
```

```
-13.2388
```

*Q*2

```
A = ones(1, 10);
disp('Array of ones with 10 elements is:')
```

```
Array of ones with 10 elements is:
```

```
disp(A)
```

```
Column 1

   1

Column 2

   1

Column 3

   1

Column 4

   1

Column 5

   1

Column 6

   1

Column 7

   1

Column 8

   1

Column 9

   1

Column 10

   1
```

```
B = [2 3 zeros(1, 8)];
disp('Second array will be:')
```

```
Second array will be:
```

```
disp(B)
```

```
  Column 1

     2

  Column 2

     3

  Column 3

     0

  Column 4

     0

  Column 5

     0

  Column 6

     0

  Column 7

     0

  Column 8

     0

  Column 9

     0

  Column 10

     0
```

Q3

```
A = [4 -6; 6 10];
B = [6 -13; 3.4 16];
disp('A+B is:')
```

```
A+B is:
```

```
disp(A+B)
```

```
  Column 1

   10.0000
```

```
    9.4000

  Column 2

  -19.0000
   26.0000
```

```
disp('B*B is:')
```

```
B*B is:
```

```
disp(B*B)
```

```
  Column 1

   -8.2000
   74.8000

  Column 2

 -286.0000
  211.8000
```

```
disp('AB is:')
```

```
AB is:
```

```
disp(A*B)
```

```
  Column 1

    3.6000
   70.0000

  Column 2

 -148.0000
   82.0000
```

```
disp('Transpose of AB is:')
```

```
Transpose of AB is:
```

```
disp((A*B).')
```

```
  Column 1

    3.6000
 -148.0000

  Column 2

   70.0000
   82.0000
```

```
disp('A-B is:')
```

```
A-B is:
```

```
disp(A-B)
```

```
  Column 1

   -2.0000
    2.6000

  Column 2

    7.0000
   -6.0000
```

```
disp('A/B is:')
```

```
A/B is:
```

```
disp(A/B)
```

```
  Column 1

    0.6020
    0.4422

  Column 2

    0.1141
    0.9843
```

```
disp('Inverse of A is:')
```

```
Inverse of A is:
```

```
disp(inv(A))
```

```
  Column 1

    0.1316
   -0.0789

  Column 2

    0.0789
    0.0526
```

```

```

$Q4$

```
A = [5 6 10; -3 0 14; 0 -7 21];
B = [4 10 0].';
M = [A B];
disp('x using Gauss Jordan elimination is:')
```

```
x using Gauss Jordan elimination is:
```

```
disp(rref(M))
```

```
  Column 1

    1.0000
         0
         0
```

```
  Column 2

         0
    1.0000
         0

  Column 3

         0
         0
    1.0000

  Column 4

   -1.4545
    1.2078
    0.4026
```

```
disp('x using A inverse is:')
```

```
x using A inverse is:
```

```
disp(A\B)
```

```
   -1.4545
    1.2078
    0.4026
```

```
syms x y z;
eqn1 = 5*x + 6*y + 10*z == 4;
eqn2 = -3*x + 14*z == 10;
eqn3 = -7*y + 21*z == 0;
sol = solve([eqn1, eqn2, eqn3], [x, y, z]);
disp('x using solve function is:')
```

```
x using solve function is:
```

```
disp([sol.x sol.y sol.z].')
```

$$\begin{pmatrix} -\frac{16}{11} \\ \frac{93}{77} \\ \frac{31}{77} \end{pmatrix}$$

Q5

```
A = linspace(1, 30, 30);
pos = sign(sin(A))==1;
disp('All integers between 1 and 30 for which sine is negative are:');
```

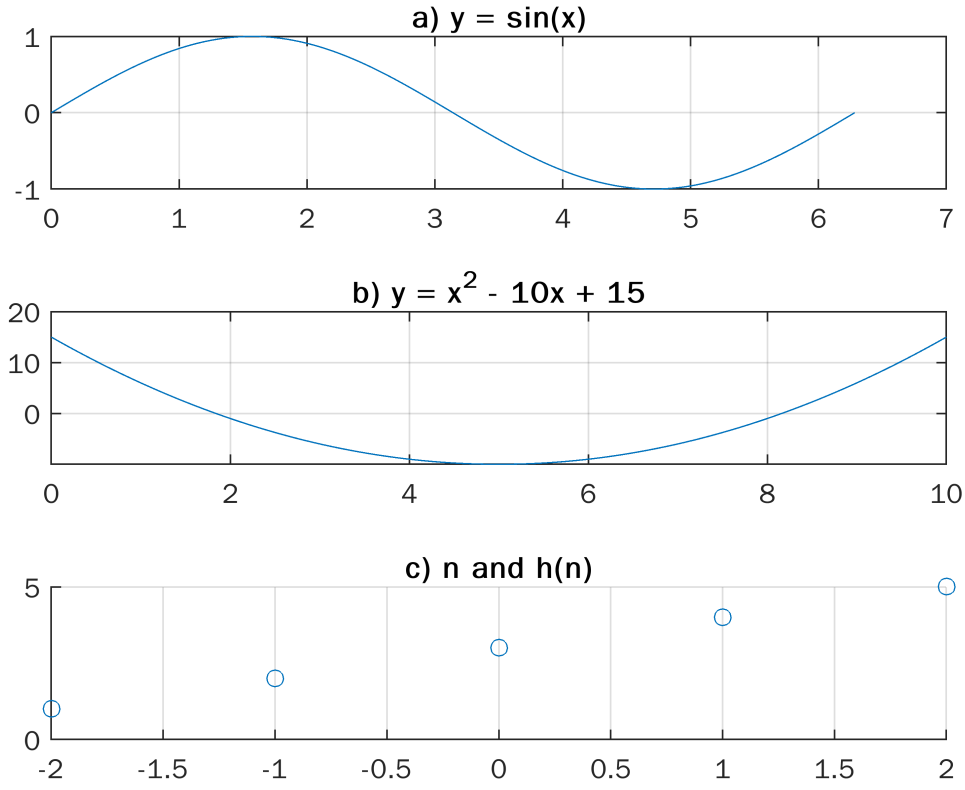
All integers between 1 and 30 for which sine is negative are:

```
disp(A(pos));
```

```
  Column 1

     1

  Column 2

     2

  Column 3

     3

  Column 4

     7

  Column 5

     8

  Column 6

     9

  Column 7

    13

  Column 8

    14

  Column 9

    15

  Column 10

    19

  Column 11

    20

  Column 12

    21

  Column 13

    26

  Column 14

    27

  Column 15

    28
```

Q6

```
tiledlayout(3, 1)
nexttile
x = linspace(0, 2*pi, 360);
y = sin(x);
plot(x,y)
grid on;
title('a) y = sin(x)')
nexttile
x = linspace(0, 10, 100);
y = x.^2 - 10*x + 15;
plot(x, y)
grid on;
title('b) y = x^2 - 10x + 15')
nexttile
n = linspace(-2, 2, 5);
h = linspace(1, 5, 5);
scatter(n, h)
grid on;
title('c) n and h(n)')
```



Q7

```
A=[3 2 -2; -3 -1 3; 1 2 0];
disp('The matrix A is:')
```

```
The matrix A is:
```

```
disp(A)
```

```
  Column 1

     3
    -3
     1

  Column 2

     2
    -1
     2

  Column 3

    -2
     3
     0
```

```
p = poly(A);
r = roots(p);
disp('Roots of chracterestic equation of matrix A is:')
```

```
Roots of chracterestic equation of matrix A is:
```

```
disp(r)
```

```
   -1.0000
    2.0000
    1.0000
```

```
[V, D] = eig(A);
disp('The eigenvector is:')
```

```
The eigenvector is:
```

```
disp(V)
```

```
  Column 1

   -0.5774
    0.5774
   -0.5774

  Column 2

    0.7071
   -0.0000
    0.7071

  Column 3
```

```
    0.0000
    0.7071
    0.7071
```

```
disp('The eigenvalues are:')
```

```
The eigenvalues are:
```

```
disp(diag(D))
```

```
   -1.0000
    1.0000
    2.0000
```

Q8

```
C = -50 + (50 + 50)*rand(1, 10);
disp('The temperatures in C are:')
```

```
The temperatures in C are:
```

```
disp(C.')
```

```
   20.6046
  -46.8167
  -22.3077
  -45.3829
  -40.2868
   32.3458
   19.4829
  -18.2901
   45.0222
  -46.5554
```

```
F = 9*C/5 +32;
disp('The temperatures in F are:')
```

```
The temperatures in F are:
```

```
disp(F.')
```

```
   69.0883
  -52.2701
   -8.1539
  -49.6891
  -40.5163
   90.2224
   67.0692
   -0.9221
  113.0400
  -51.7997
```

```
M = [C' F'];
disp('The final matrix is:')
```

```
The final matrix is:
```

```
disp(M)
```

```
Column 1

 20.6046
-46.8167
-22.3077
-45.3829
-40.2868
 32.3458
 19.4829
-18.2901
 45.0222
-46.5554

Column 2

 69.0883
-52.2701
 -8.1539
-49.6891
-40.5163
 90.2224
 67.0692
 -0.9221
113.0400
-51.7997
```

Q9

```
C = -50 + (50 + 50)*rand(1, 10);
disp('The temperatures in C are:')
```

```
The temperatures in C are:
```

```
disp(C);
```

```
  Column 1

   -6.1256

  Column 2

  -11.8442

  Column 3

   26.5517

  Column 4

   29.5200

  Column 5

  -31.3127

  Column 6

   -1.0236

  Column 7
```

```
   -5.4414

  Column 8

   14.6313

  Column 9

   20.9365

  Column 10

   25.4687
```

```
F = c2f(C);
disp('The temperatures in F are:')
```

```
The temperatures in F are:
```

```
disp(F)
```

```
  Column 1

   25.8744

  Column 2

   20.1558

  Column 3

   58.5517

  Column 4

   61.5200

  Column 5

    0.6873

  Column 6

   30.9764

  Column 7

   26.5586

  Column 8

   46.6313

  Column 9

   52.9365

  Column 10

   57.4687
```

$Q10$

```
n = 25;
disp(['The factorial of ' num2str(n) ' is: ' num2str(fact(n))])
```

```
The factorial of 25 is: 1.551121004333099e+25
```

Q11

```
x=-3;
if x>0
  str='positive';
elseif x<0
  str='negative';
elseif x== 0
  str='zero';
else
  str='error';
end
```

$Q12$

```
x=-10;
while x~=0
  x=x+1;
end
```

$Q13$

```
X=0;
for i=1:10
  X=X+1;
end
```

$Q14$

```
n = 6;
disp(['The sum of first ' num2str(n) ' integers are: ' num2str(s(n))])
```

```
The sum of first 6 integers are: 21
```

$Q15$

```
x=-10;
while x~=0
  x=x+2;
```

```
  if x == -2
    break;
  end
end
```

Q16

```
disp('Sum of all even integers from 1 to 1000 is:')
```

```
Sum of all even integers from 1 to 1000 is:
```

```
addeven(1:1000)
```

```
ans = 250500
```

```
function y = addeven(x)
  evens = x(2:2:end);
  y = sum(evens);
end

function f = s(n)
  f = sum(1:n);
end

function f = c2f(c)
  f = 9*c/9 + 32;
end

function f = fact(n)
  f = prod(1:n);
end
```