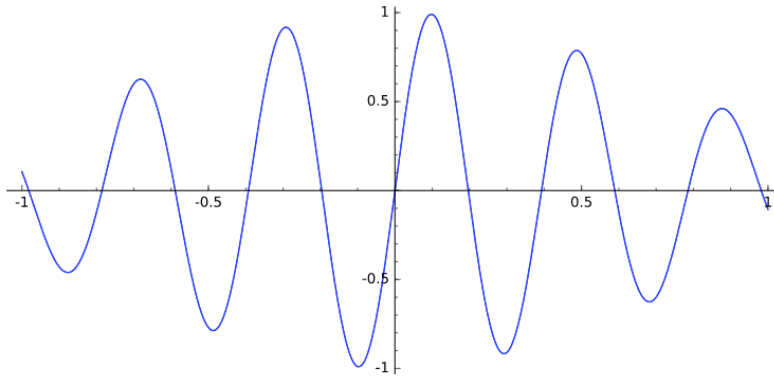# 2016 CS333000

S1 (HW3) Ans

Q1.

```
plot ((e^(-x^2))*sin (16*x), -1, 1)
```



```
N(find_root ((e^(-x^2))*sin (16*x) == 0, -1, -0.9))
N(find_root ((e^(-x^2))*sin (16*x) == 0, -0.8, -0.7))
N(find_root ((e^(-x^2))*sin (16*x) == 0, -1, 1))
N(find_root ((e^(-x^2))*sin (16*x) == 0, 0.7, 0.8))
N(find_root ((e^(-x^2))*sin (16*x) == 0, 0.9, 1))
```

```
    -0.981747704246810
    -0.785398163397448
    0.000000000000000
    0.785398163397448
    0.981747704246810
```

Q2.

```
A = random_matrix(ZZ,3,4)
print A
var('x y z')
print x*A[0][0] + y*A[0][1] + z*A[0][2] == A[0][3]
print x*A[1][0] + y*A[1][1] + z*A[1][2] == A[1][3]
print x*A[2][0] + y*A[2][1] + z*A[2][2] == A[2][3]
print A.rref()
```

```
    [ 14   0   0   1]
    [-21   1  -1   2]
    [  1  15  -1   1]
    14*x == 1
    -21*x + y - z == 2
    x + 15*y - z == 1
    [      1       0       0    1/14]
    [      0       1       0   -9/49]
    [      0       0       1 -361/98]
```

Q3.

```
x = ceil(random()*999)
print sqrt(x)
print N(sqrt(x))
```
      5*sqrt(21)
      22.9128784747792

Because sagemath loves exact answer, so if you did not add N() before
the value, it will give you the simplified and exact answer.
After add N(), you will get the numerical value.