

## Quiz 2

100 points (10 points per problem)  
(Version A)

### Problem 1

Briefly state or describe the Central Limit Theorem.

### Problem 2

Show how to generate random numbers from the distribution

$$f(x) = 3x^2$$

where  $x$  can be between 0 and 1.

### Problem 3

For each of the following, state which distribution type the results will follow (Uniform, Normal, etc.)

```
X=sum(randn(10^5,10),2)
```

```
P=.002
```

```
N=1000
```

```
X=sum(P>(rand(N,10^5)))
```

```
P=.002
```

```
N=1000000
```

```
E=find(P>rand(N,1))
```

```
X=E(2:end)-E(1:end-1)
```

#### Problem 4

Describe the difference between the Euler method and the fourth-order Runge-Kutta method.

#### Problem 5

In your homework, you created a 'RK4' class. Write the anonymous function that you would need for a simple (undamped, undriven) mass on a spring.

#### Problem 6

The following is a class definition. Write the code necessary to use the class to set and then add the 'A' and 'B' properties

```
classdef Adder < handle
    properties
        A
        B
    end
    methods
        function Out=addEm(obj)
            Out=obj.A+obj.B;
        end
    end
end
```

#### Problem 7

Add the missing code that will produce the output below.

```
syms x(t) a
DX=
dsolve(
```

```
ans =
```

```
c9*exp(-a*t)
```

### Problem 8

Draw what the histogram would look like for the following:

X =

```
0.5728
1.9250
2.1361
2.0790
2.5487
0.3935
1.4150
1.0104
2.5675
```

hist(x, (0:3))

### Problem 9

A =

```
1 2
3 4
```

B =

```
1 3
5 6
```

write the output for:

A\*B

and

A.\*B

### Problem 10

What is the most useful thing you have learned so far in 290?