Q1

```
a = 5;
d = 5;
Area_s = a*a;
Area_c = pi * d^2/4;

Diff = Area_s - Area_c;
disp(Diff)
```

```
    5.3650
```

Q2

```
t1 = 1:0.5:10;
t2 = 1:2:10;
```

Q3

```
t1_last_element = t1(end)
```

```
t1_last_element = 10
```

```
t2_last_element = t2(end)
```

```
t2_last_element = 9
```

The difference in the last elements of array t1 and t2 is caused by the step sizes used in creating both arrays. Because the step size of array t2 is 2, when matlab generates element 9 and attempts to create the next element, it sees that the next element should be 11 which is greater than the array end of 10 specified when I initialize array t2. Matlab therefore truncates the array at this point.

Q4

```
y1 = sin(t1);
y2 = cos(t1);
```

Q5

```
y_verification = y1.^2 + y2.^2
```

```
y_verification = 1×19
    1.0000    1.0000    1.0000    1.0000    1.0000    1.0000    1.0000    1.0000 ···
```

It can be seen that sin^2(x) + cos^(x) = 1 from the values of the vector called y_verification

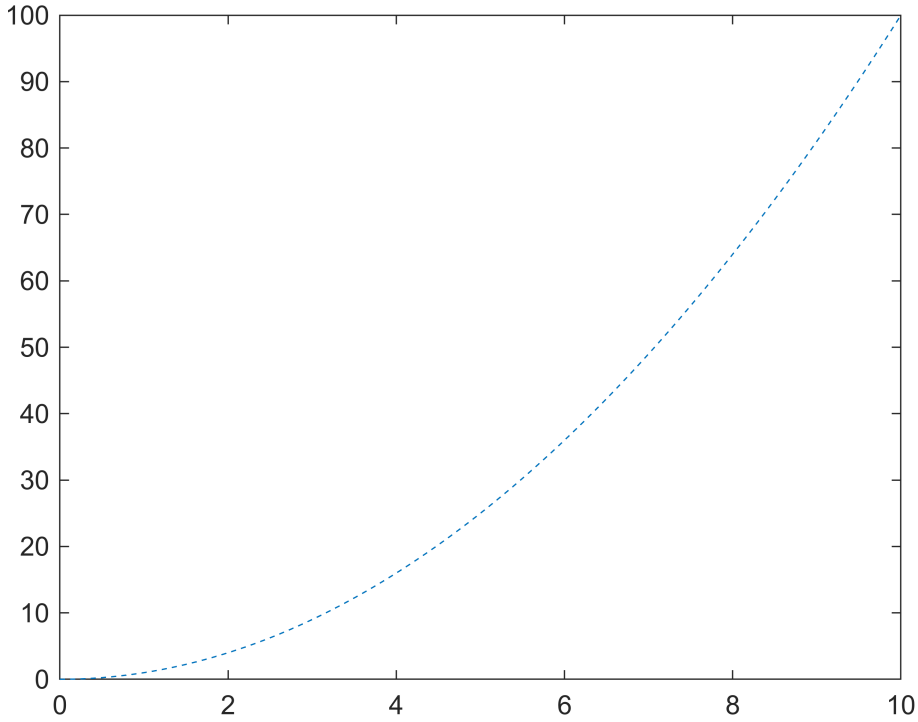
Q6

```
t = 0:0.101:10;
```

Q7

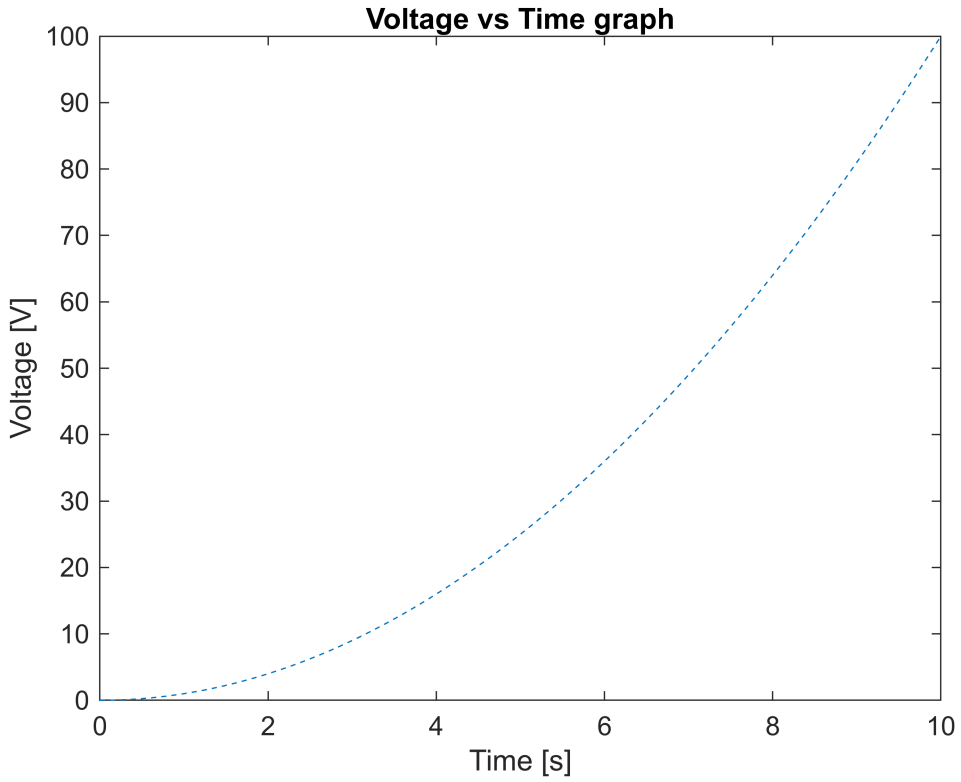
```
y_val = t.^2;
```

```
plot(t, y_val, "--")
```



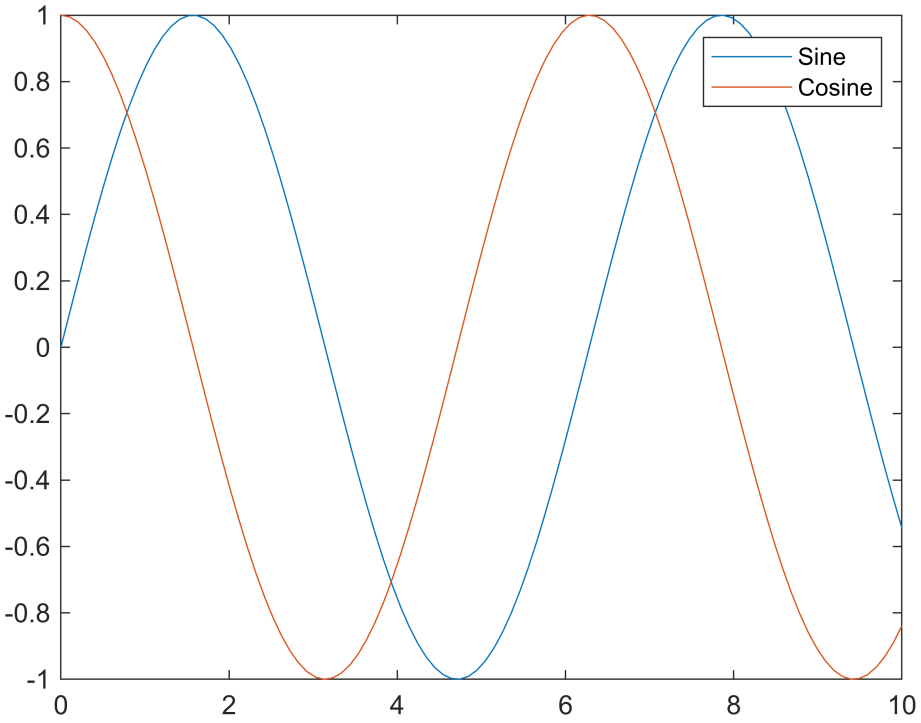
Q8

```
plot(t, y_val, "--")
xlabel("Time [s]")
ylabel("Voltage [V]")
title("Voltage vs Time graph")
```



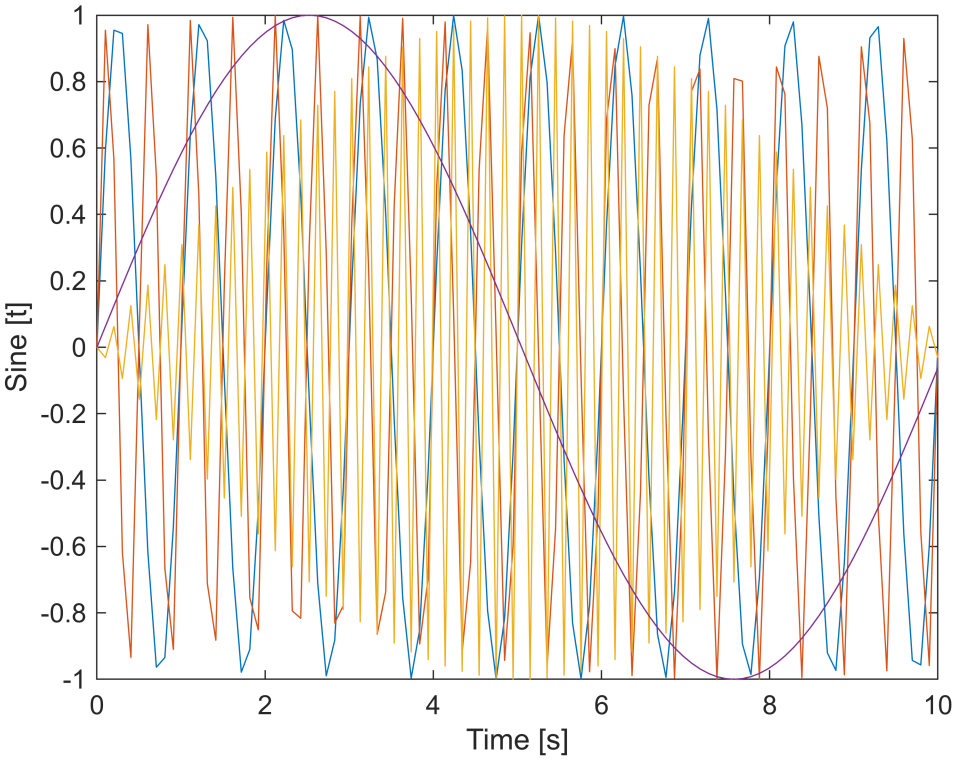
Q9

```
sin_val = sin(t);
cos_val = cos(t);
plot(t, sin_val, t, cos_val)
legend("Sine","Cosine")
hold off
```



Q10

```
f = [1 2 5 10];
for i=1:4
    plot(t, sin(2*pi*f(i)*t))
    hold on
end
xlabel("Time [s]")
ylabel("Sine [t]")
hold off
```


Sine [t]
Time [s]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
2
4
6
8
10