

### **MATLAB, Lab 3 – Individual work**

1. Write a script to create a single coordinate system graphs of  $y1(t) = \sin(t)$  and  $y2(t) = \cos(t)$  for  $0 \leq t \leq \pi$ . Function  $y1(t)$  should be plotted in yellow with dotted line and  $y2(t)$  in black with dashed line. Change the line width to 3. After creating a chart, add the grid, scale the charts so they occupy the entire space of available drawing.

Code:

```
t = 0:pi/100:pi;  
y1= sin(t);  
y2= cos(t);  
  
h1=plot(t,y1,':y',t,y2,'--k');  
set(h1,'LineWidth',3);  
axis([0 pi -1 1]);  
  
grid on;
```



Screenshot:

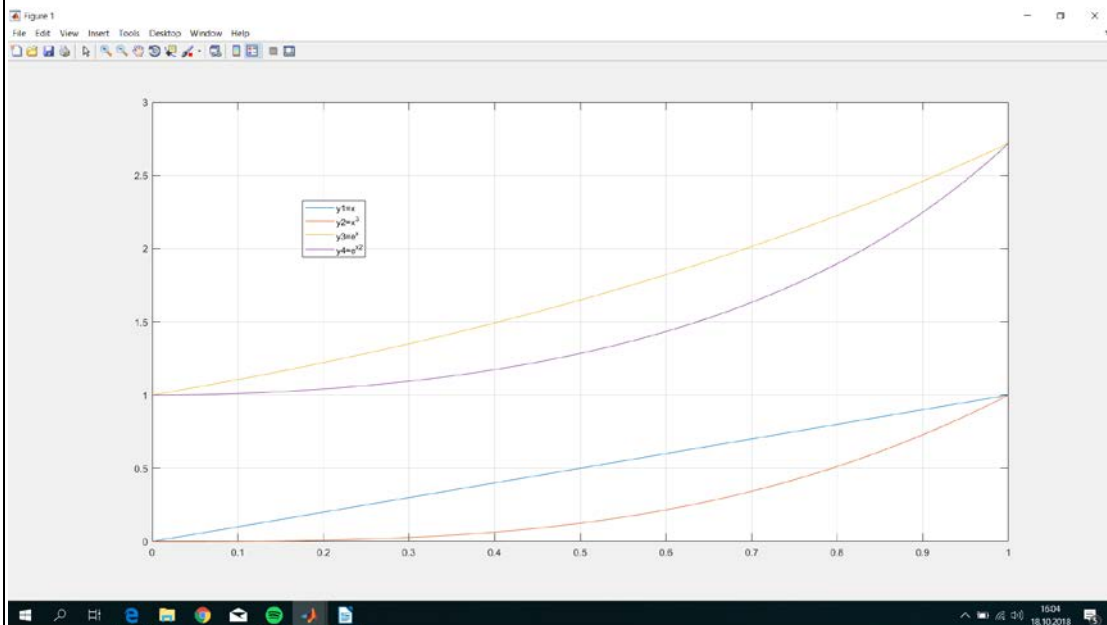
2. Create graphs of functions:

- a.  $x, x^3, e^x, e^{x^2}$  for  $0 \leq x \leq 1$  in linear scale. Add a legend.

Code:

```
x = 0:1/100:1;  
  
y1=x;  
y2=power(x,3);  
y3=exp(x);  
t=power(x,2);  
y4=exp(t);  
h1=plot(x,y1,x,y2,x,y3,x,y4);  
legend(h1, 'y1=x', 'y2=x^3', 'y3=e^x', 'y4=e^x^2')  
grid on;
```

Screenshot:



- b.  $x, x^3, e^x, e^{x^2}$  for  $0 \leq x \leq 1$  use a logarithmic scale on the y-axis (func. **semilogy**). Add a legend and place it on the left side at the bottom.

Code:

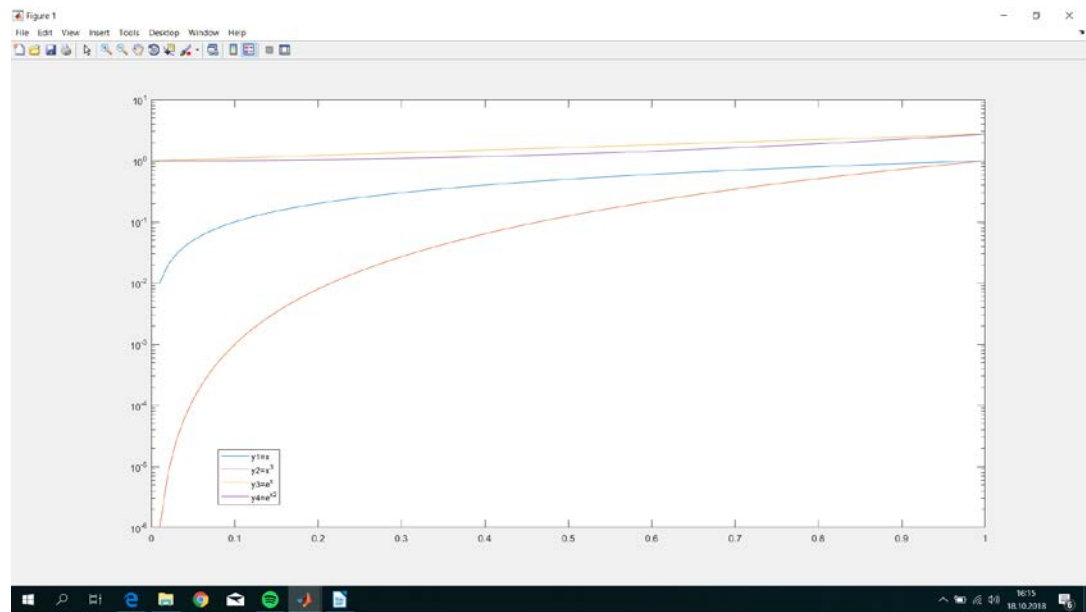
```
x = 0:1/100:1;
```

```

y1=x;
y2=power(x,3);
y3=exp(x);
t=power(x,2);
y4=exp(t);
h1=semilogy(x,y1,x,y2,x,y3,x,y4);
legend(h1,'y1=x','y2=x^3','y3=e^x','y4=e^x^2');

```

Screenshot:



- c.  $x$ ,  $x^3$ ,  $e^x$ ,  $e^{x^2}$  for  $0 \leq x \leq 1$  use a logarithmic scale on both axes (loglog function). Instead of a legend, add text annotations.

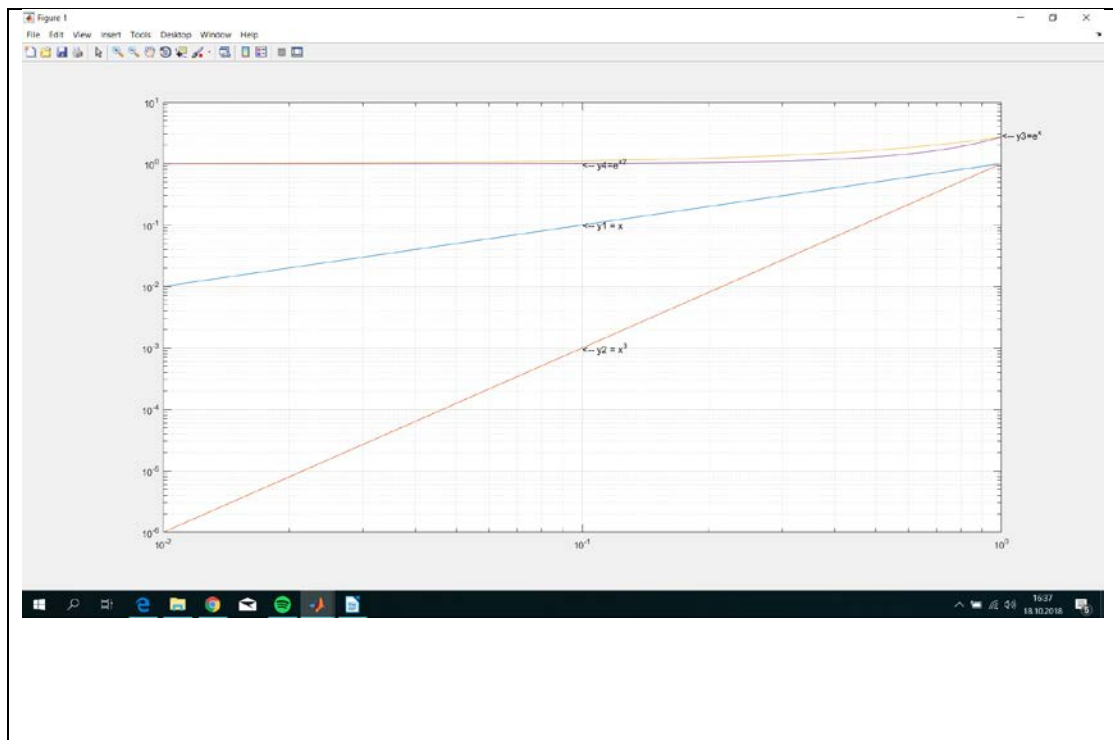
Code:

```

x = 0:1/100:1;
y1=x;
y2=power(x,3);
y3=exp(x);
t=power(x,2);
y4=exp(t);
h1=loglog(x,y1,x,y2,x,y3,x,y4);
grid on;
text(power(10,-1),power(10,-3),'<-- y2 = x^3');
text(power(10,-1),power(10,-1),'<-- y1 = x');
text(power(10,-1),1,'<-- y4=e^x^2');
text(1,3,'<-- y3=e^x');

```

Screenshot:



3. Create a graph of the function  $y(t) = \ln 2 + t + t^2$  for  $0 \leq t \leq 50$ . Scale the graph so that:  $5 \leq t \leq 20$  and  $30 \leq y \leq 600$ . Add a title written with bold font. Axis labels should be written in italic.

Code:

```
t = 0:1/100:50;

y = log(2)+ t + power(t,2);
plot(t,y);
axis([5 20 30 600]);
title('function y =  
ln(2)+t+t^2','FontSize',14,'FontName','Bold');
xlabel('t','FontSize',15,'FontName','Italic');
ylabel('y','FontSize',15,'FontName','Italic');
```

Screenshot:

