SHEET (1)

1-What are you expecting to see in the command window after running the following scripts? Also, Comment on your answer.

a-clc; Clear; **x=3;** **Y=x^2+3*x+7**	**b-Clc; Clear;** **X=3** **Y=x^2+3*x+7**	**c-clc; Clear;** **x=3;** **Y=x^2+3*x+7;**
d-Clc; x=3; **Clear x** **Y=x^2+3*x+7;** **Z=2*Y**	**e-Clc; X=3; Clear;** **x=3;** **Y=x^2+3*x+7** **Z=2Y^2**	**f-Clc; Clear;** **x=3** **Y=x^2+3*x+7;** **Z=2*Y**

2- Based on the priority of conducting the mathematical operations in the MATLAB program, Calculate the expected answers of the following mathematical operations.

>> 2*2^2 >> 5^2*2 >> 2^5+2 >> 2^2/2
>> 2^2\2 >>(2+6/(1+2))^2 >>(2*6/(1+2))^2 2^(2+2*2)

3- Using the values x = 10, y = 3. Use MATLAB to compute the following, and check the results with a calculator.

a. $u = x + y$ **b.** $v = xy$ **c.** $w = x / y$
d. $z = \sin x$ **e. r =** $8 \sin y$ **f.** $s = 5 \sin (2y)$

4- Correct the following codes

i-Clc clear **a=1;b=2;c=1.8;** **x=log10c/log(a+b+c)+2*sinha-…3tanb**	**ii- clc,clear** **x=5*pi/6;** **b=(tan(x)+sin(2x))/cos(x)+ln(x^5-…x^2)+cosh(x)-2*tanh(x)**	**iii- clc,clear** **x=5+8*i; y=-6+7*I z=exp(x)** **r=sqrt(y) ,,s=(xy^2)**

5- Find the value for the following expressions

a. $area = \pi/4(do^2 - di^2)$ **,** do**=100 mm ,**di**=40 mm**

b. $stress = \frac{(\sigma_x+\sigma_y)}{2} + \sqrt{(\frac{\sigma_x-\sigma_y}{2})^2 + \tau_{xy}^2}$ **,** σ_x**=100,** σ_y**=80,** τ_{xy}**=52 MPa**

6- Two trigonometric identities are given by:

a. $\tan 3x = 3\tan x - \tan^3 x / 1 - 3\tan^2 x$ **b.** $\cos 4x = 8(\cos^4 x - \cos^2 x) + 1$

For each part, verify that the identity is correct by calculating the values of the left and right sides of the equation, substituting $x = 45°$

7- Find the maximum lateral deflection and the maximum bending stress for the supported cantilever subjected to a force at the free end(take modulus of elasticity E = 200 GPa, F=14 kN, l **= 1 m, diameter of shaft d is 20 mm)**

Lateral Deflection= $F L^3/3$ **,** $I = \pi/64 * d^4$

SHEET (1)

8- Find the volume of a sphere having a radius of 15 cm. assume a cylinder having a volume equal to that of the sphere. Calculate the radius of the cylinder if its height is 45 cm.

9-Using the fprintf, write the values of the volume and radius of the cylinder of the previous problem resultants in a document file of the name "Results of Calculations".

10- When a belt is wrapped around a cylinder, the relation between the belt forces on each side of the cylinder is

$F1=F2e^{\mu\beta}$

Where β is the angle of wrap of the belt in radian and μ is the friction coefficient. Write a script file that first prompts a user to specify β, μ, and $F2$ and then computes the force $F1$. Test your program using input, fopen and fprintf functions with the values β = 130°,

μ = 0.3, and $F2$ = 100 N. (Hint: Be careful with β!)