

Info 3 Introduction to MATLAB®

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Homework 1 (Solution)

Commands (3pts)

- MATLAB commands that calculates the following functions and the obtained results

Function	MATLAB Command	Result
$a = 2; b = 3; c = -1;$ $\alpha = 60, \beta = \pi/2$	<code>a=2;b=3;c=-1;alpha=60,beta=pi/2</code>	
$E_1 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$	<code>E1 = (-b - sqrt(b^2-4*a*c))/(2*a)</code>	-1.7808
$E_2 = \frac{ae^{-3ab+2}}{5b}$	<code>E2 = (a*exp(-3*a*b+2))/(5*b)</code>	1.5005e-08
$E_3 = e^{0.05\alpha + \sqrt{a+1}}$ $+ \frac{\sin \beta}{\sqrt{ ab - 10 + 5}}$	<code>E_3 = exp(0.05*alpha + sqrt(a+1)) + sin(beta)/(sqrt(abs(a*b-10)+5))</code>	113.8615

Data types (1.75 pts)

- Commands that help to create the indicated variables based on the given workspace window

Workspace					
Name ▲	Value	Size	Class	Bytes	
 var1	30	1x1	int16	2	
 var2	30	1x1	double	8	
 var3	110	1x1	uint32	4	
 var4	'2340'	1x4	char	8	
 var5	0	1x1	logical	1	
 var6	-5.2300	1x1	single	4	
 var7	'int16'	1x5	char	10	

`% Commands`

```
>> var1 = int16(30);  
>> var2 = 30;  
>> var3 = uint32(110);  
>> var4 = '2340';  
>> var5 = false;  
>> var6 = single(-5.23);  
>> var7 = 'int16';
```

Input and Output functions (3pts)

1. The output of the following commands using MATLAB Command window.

```
>> n = input('pleas enter a name ', 's')  
pleas enter a name  
>> disp('University of Jijel')  
University of Jijel  
>> alpha = pi; disp(cos(alpha) - 1)  
-2  
>> a = 3; fprintf('La some de %d et de %.2f et %.3f \n', a , 2*a, a+2*a)  
La some de 3 et de 6.00 et 9.000  
>> A = 8.321; B = 0.2; fprintf('Product of A and B is %.3f \n', A*B)  
Product of A and B is 1.664  
>> A = 3.231; B = 0.22; fprintf('%.2f - %.3f = %.0f \n', A, B, A-B)  
3.23 - 0.220 = 3
```

Script file (5 + 0.75 + 1.5 pts)

1. Script file that calculates the surface area of a rectangular pyramid given by:

$$Surface\ Area = \frac{1}{2}(w\sqrt{4h^2 + l^2} + l\sqrt{4h^2 + w^2})$$

where: w is the base width, l is the base length and h represents the height.

pyr_area.m

```
% This script calculates the surface area of a rectangular pyramid given by:
% Surface_Area = 1/2(w*sqrt(4h^2+l^2 )+l*sqrt(4h^2+w^2 ) )
% where: w is the base width, l is the base length and h represents the height.

% Prompt user to input the base width, the base length and the height
w = input('Enter the base width of the pyramid: ');
l = input('Enter the base length of the pyramid: ');
h = input('Enter the height of the pyramid: ');

% Calculate the area
s_area = (1/2)*(w*sqrt(4*h^2+l^2 )+l*sqrt(4*h^2+w^2 ) );

% Display the result
fprintf('The surface of this pyramid is : %.2f square units\n', s_area);
```

1. the surface of the indicated cones using the developed script

Cone	Surface
pyramid 1: w= 5.53, l= 3.8, h=1.	23.05
pyramid 2: w= 8.2, l= 10.45, h=1.	87.72
pyramid 3: w= 120, l= 38.22, h=1.	4589.86

- a. Appropriate commands to

- 1) Save the obtained results in PData.mat file

```
>> save('PData.mat')
```

- 2) Save the variables of pyramid 1 in pyramid1.mat file

```
>> save('pyramid1.mat','w1','l1','h1')
```

- 3) Load the *Surface Area* of the first pyramid from PData.mat

```
>> load('PData.mat',' s_areal')
```